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The Conference Proceedings of the 1997 Air  
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WCTR Society

Volume 1, Number 3

Editors

Tae Hoon Oum

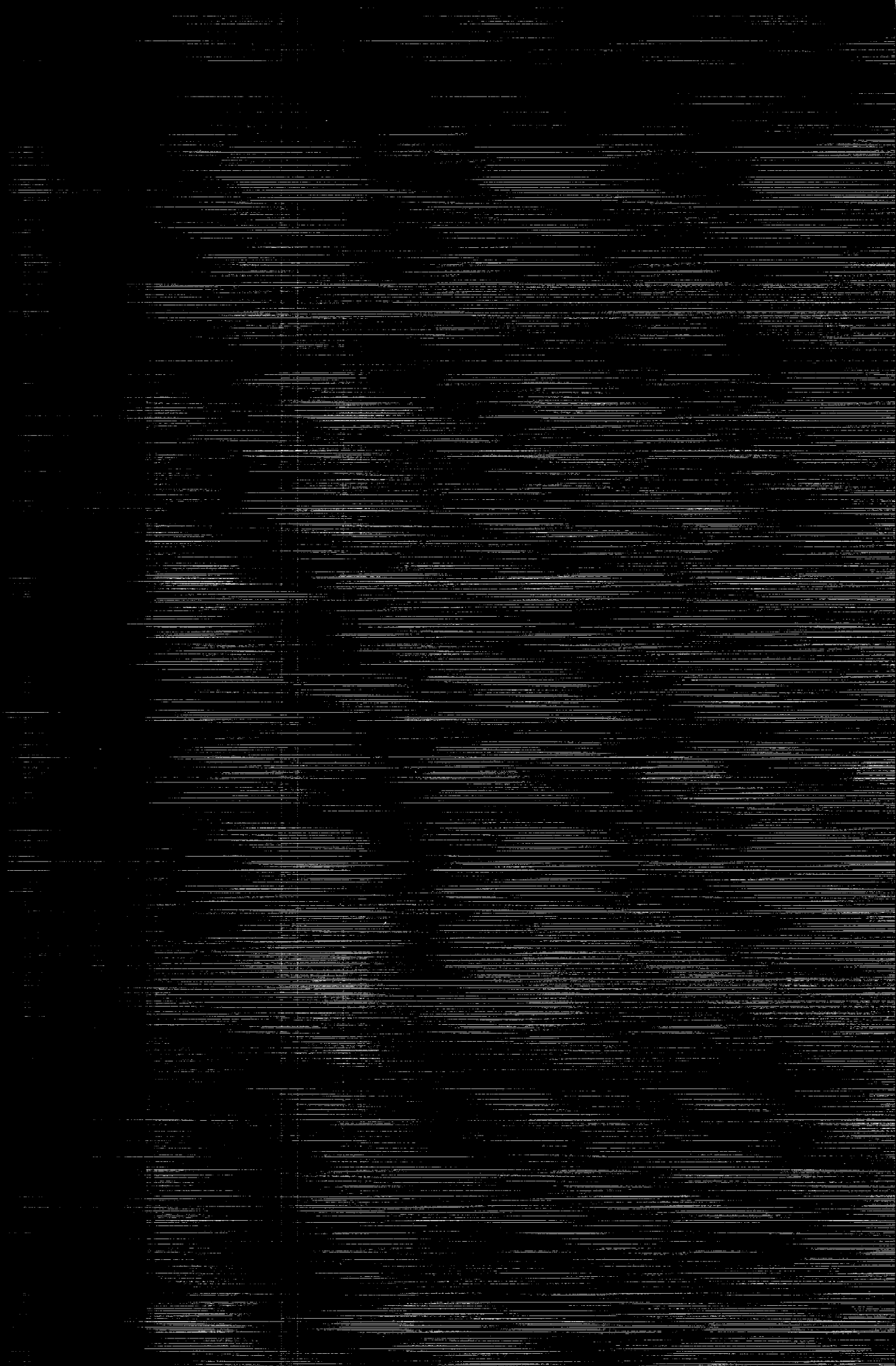
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## Industrial Reform and Air Transport Development in China

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**Key Words:** China's airline industry; State-owned enterprises reform; Airline structure, conduct and performance in China

**Abstract:** This article describes the regulatory and enterprise reform in the Chinese airline industry and its impact on the industry's development. China's transport sector is one of the largest sectors of the Chinese economy while aviation has been the fastest growing mode. Chinese civil air transport has grown by an average of 20 percent a year since 1980 - 4.3 times the world average. The article starts with a description of China's general economic and industrial reform, followed by a description of reforms in the air transport sector. It then examines the impact of the reform on the growth and development of China's airline industry. In particular, the following aspects of the industry are discussed: air traffic growth and route development, market structure, and airline operation and competition.

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## I. INTRODUCTION

As China moves from a centrally planned economy to a market economy, many sectors have witnessed, for the last 18 years, either policy liberalization or a shift in decision-making power from central to local government. By 1993 China's economy had become essentially a market economy in the sense that some two-thirds or more of national output was produced by profit-seeking economic units. Although rural reforms turned out to be very successful, the industrial reform proved to be much more difficult. Industry is the largest sector of the Chinese economy, accounting for 50 percent of total output and 80 percent of exports, and employing more than 100 million workers in 1992.

The core of China's industrial reform has been the reform of thousands of large- and medium-size state-owned enterprises (SOEs). Most of the existing literature on the SOE reform is based on cross-section studies of many industries. However, Jefferson and Rawski (1994, p. 50) pointed out in a comprehensive survey of Chinese enterprise reform: "The problem is complex: the population of state-owned enterprises is large and diverse; the reforms are partial and uneven; they consist of measures that permit (rather than mandate) new course of action; and outcomes are ambiguous. A full analysis must penetrate to the enterprise level and transcend the evidence available from anecdotes, small samples, and fragile statistical aggregates." This suggests an industry-case-study approach.

This article describes the regulatory and enterprise reform in the Chinese airline industry and its impact on the industry's development. China's transport sector is one of the largest sectors of the Chinese economy while aviation has been the fastest growing mode since the early 1980s. Table 1 shows the composition of non-urban transport activities (passenger kilometers) in recent years. The average annual growth rate of civil aviation in China was 20.7% during the 1980-94 period - 4.3 times the world average, while the average annual growth rate of all modes of transportation was 9.9% in the same period. Air transport has also become more important in intercity transport: its proportion of passenger kilometres of all modes has increased from 1.7% in 1980 to 6.4% in 1994. In 1994 China ranked 8th in the world in terms of total air passenger-kilometers performed, compared with its 33th place in 1980, while its domestic passenger-kilometers ranked 4th, just behind the U.S., Russia and Japan.

Such a high growth rate appears beyond the expectation of Chinese transport planners. For example, the Development Research Center of the State Council, an economic think tank of the central government, made the following forecast in 1985: the total tonne-kilometers performed by the Chinese airlines would reach 5.0-5.5 billion at year 2000, with an average annual growth rate of 13% (DRCSC, 1988). However, the industry performed 5.8 billion total tonne-kilometers in 1994,

**TABLE 1: Modal Split in Non-Urban Transport in China**  
(Billion passenger-km)

	1980	1985	1990	1994	Annual Growth 1980-94
Rail	138.32	241.61	261.26	363.61	7.1%
Road	72.95	172.49	262.03	422.03	13.4%
Water	12.91	17.86	16.49	18.35	2.5%
Air	3.96	11.67	23.05	55.16	20.7%
Total	228.10	443.70	562.80	859.10	9.9%

Sources: Yearbook (1995).

exceeding the estimate for year 2000.

Besides its tremendous growth, China's airline industry offers an interesting and prominent example of profound changes in a state industry caused by a historic reform experiment. Taken together, these two observations suggest that an examination of this industry may be particularly useful to study China's SOE reform and to further draw implications for the general process of completing transition from a centrally planned economy to a market economy.

My second objective in this article is to better understand the development of China's air transport and its aviation policy. The airline industry is currently undergoing major structural changes throughout the world. There is a world wide tendency to deregulate/liberalize the airline industry and promote competition in both domestic and international markets. Globalization of the industry seems increasingly likely; experts predict that a small number (5-10) of global carrier networks are to be formed within the next decade. The rapid growth of China's economy, size of its population, and geopolitical importance of its location in Asia, all, point that China will likely to play a key role in shaping the pattern of airline networks in Asia and the linkage with other continents. Despite its importance little has been written on the Chinese airline industry. This article is a step towards filling that void.

The present paper focuses mainly on China's domestic airline market; its international aviation policy and operation will be discussed in a separate paper. The article is organized as follows. Section II contains a description of China's general economic and industrial reform. Section III describes reforms in the air transport sector. This is followed, in Section IV, by an examination of the impact of the reform on the growth and development of the industry. The airline competition in

China's domestic markets is also discussed in Section IV. Finally, Section V contains concluding remarks.

## II. INDUSTRIAL REFORM

The economic reform policy was instituted at the Third Plenary Session of the 11th Central Committee of the Communist Party of China in December 1978. A "gradual" reform strategy was adopted (as opposed to the "big-bang" approach applied in some East European countries). Agriculture was the first area in which China implemented reforms. The results were clear: agricultural output increased by 67% between 1978 and 1985, and productivity (measured as the amount of output for a given amount of inputs) increased by nearly 50%, compared with no increase in productivity over the previous two and half decades (Lin, 1992; McMillan et al., 1989). The increase in agricultural productivity in turn spurred the growth of rural enterprises, or the Township Village Enterprises - TVEs, by generating a pool of savings and excess labour (Byrd and Lin, 1990). Beginning from a small base, TVEs were allowed to grow with few of the restrictions that hobbled state-run industries and TVEs expanded rapidly. A number of studies have recently been done to explain the success of TVEs (e.g., Weitzman and Xu, 1994; Chang and Wang, 1994; Li, 1995).

The industrial reform was felt in 1979 and instituted at the Third Plenary Session of the 12th Central Committee of the Communist Party of China late in 1984. The core of this reform program was to transform thousands of large- and medium-size SOEs to profit-seeking economic units in a market economy. A popular official slogan was that "the goal of the SOE reform is to make the enterprise independent, autonomous and responsible for profits and losses." As such, the reform so far may be characterized as an evolutionary process of re-assignment of decision rights and residual claims from the state to the inside members of the enterprise (i.e., the manager and workers). The argument for shifting the decision rights to the manager of the firm was based on the assumption that managerial decisions are more efficiently made at the firm level than at the central planner level owing to information/communication problems. While the theoretical legitimacy of this assumption dates at least back to Hayek (1945), Chinese economists were mainly based their argument on the observed poor performance of its central planned system (Zhang, 1996). In particular, the rationale for shifting residual claims to the members of the firm was based on incentive considerations. Although modern theory of incentives was just recently introduced into China, the pre-reform Chinese experience seemed sufficient for both Chinese economists and reform-minded political leaders to understand how essential an incentive system is for economic performance.

State-owned enterprises are the natural focus of any effort to evaluate the progress of China's

industrial reform. Indeed, the SOE reform has been the central component of China's overall reform package since the early 1980s. The dominant view among Chinese economists is that the SOE reform has not been very successful, at least in terms of profit rate measures (Zhang, 1996). The number of SOEs running at a loss has been rising, and the amount of loss has been increasing. In 1993, for instance, the total losses from state-owned industrial enterprises was 45.3 billion yuan (RMB), about 14 times the losses in 1985. Due to the wide scope and huge amount of losses in the state sector, the government's subsidy to SOEs also swelled, taking a 37% jump from 1986 to 1992. Furthermore, the SOEs' contribution to the government's revenue have been declining. The ratio of profit plus tax over sales revenue for the SOEs dropped from 26% in 1980 to 12% in 1992 (Lin, 1996).

Studies by western economists, on the other hand, focus mainly on the effects of reform on total factor productivity (TFP) growth in Chinese state enterprises. The results have been mixed. Woo, *et al.* (1994), for example, found that TFP growth in SOEs was zero at best in the 1984-1988 period. This is in contrast to several other studies (Chen, *et al.*, 1988; Jefferson, Rawski and Zheng, 1992; World Bank, 1992; Gordon and Li, 1995), that found significant improvements in SOEs' productivity. Their estimates of annual TFP growth in the 1980s range from 2 to 4 percent, compared with almost zero percent growth prior to the reform.

From the social perspective, the increase in the SOEs' TFP indicates the success of the SOE reform. But the government, as the owner of the SOEs, does not seem to directly benefit from the reform. The productivity improvement and the decline of profit rate may be reconciled, however. As indicated above, the SOE reform can be characterized as a process of re-assignment of decision rights and residual claims from the state to the members of the enterprise. This improves the incentive of managers and workers to improve efficiency and pursue profits. On the other hand, managerial discretion brought by the managerial decentralization may be abused such that managers become actual residual claimants, although the state is a legal residual claimant of the enterprise. More specifically, the SOEs are owned by the state but run by the managers and workers. Due to the asymmetric information and high monitoring cost, the managers might reduce the profits submitted to the state by overstating costs and/or under-reporting revenues. Although managers cannot easily pocket the profits, they have many opportunities to spend the enterprise's money. As a result, we see an improvement in SOEs' efficiency on the one hand but a decline in profits in official statistics on the other hand.

The above discussions suggest two directions for deepening China's SOE reform. First, given the current structure of public ownership, one solution to the managerial discretion problem is to create a competitive product market. An enterprise's profit level in a fair, competitive product

market may be a sufficient information indicator of the managers' performance. Second, a longer-term solution should have the residual claim and control right be paired as much as possible. This calls for the privatization of the state enterprises. The Chinese airline industry, building on its earlier reform measures, appears to move towards these directions.

### III. REFORMS IN THE AIRLINE INDUSTRY

China's airline industry was founded during the early 1950s when the country was established and needed airlines as a national instrument to carry out its policy for government administration, trade and tourism. Prior to 1980, the industry was a semi-military organization with the Civil Aviation Administration of China (CAAC) as a department of air force for most of the years. The "chain of command" within CAAC was a four-level administration system: CAAC, six regional civil aviation bureaus, twenty-three provincial civil aviation bureaus, and seventy-eight civil aviation stations. CAAC not only acted as a regulator of civil aviation, but also directly managed air transport services. The lower-level operation units could not make important operational decisions and were not independent economic entities responsible for their own profits and losses. The industry was regulated in every aspect of air services provision including market entry, route entry, frequency, pricing and even passenger eligibility for air travel and was, therefore, a CAAC monopoly.

The Chinese airline reform, which started in the late 1970s, was due primarily to unsatisfactory performances of the traditional central planned system. First, the airline industry had been suffering persistent financial losses. From 1953 to 1978, the industry had witnessed fourteen years of financial losses even after taking account the central government's subsidy to the industry. Of the fourteen years, the 1968-74 period produced seven consecutive years of losses totalling 360 million yuan (Shen, 1992).

Second, demand for air services was severely suppressed under the old system and as a result, the development of the airline industry was stagnant. The air share of domestic intercity traffic volume remained largely constant at about 1 percent over the 1950-80 period. The main task of air transportation was for government administration: most passenger travel by air was for administrative affairs for various levels of governments and large state-owned enterprises rather than doing business. The lack of commercial demand made the airline market rather small. Moreover, the military management of airlines and airports created no competition in the market and resulted in inefficient and low quality services, further stifling demand. In fact, it took 24 years (after 1950) for CAAC to reach the highest traffic level in the Chinese aviation history (Wang, 1989).

The airline reform may be divided into two stages. The first stage occurred between 1980

and 1986 and the aim was to bring back business aspects to air transportation. The administrative structure was reformed first in 1980 and then again in 1982 which effectively separated civil aviation from the air force. Beginning 1981 the central government adopted the policy of "self-responsible for losses and extra-profit retention" towards the airline sector. The policy was simplified to a one-nine division of airline revenue between the state and CAAC. Within CAAC, six regional civil aviation bureaus became basic units for recording profits and losses in 1979. The practice was further extended to twenty-three provincial civil aviation bureaus a year later. Furthermore, CAAC in 1982 extended the profit-retention system to six regional civil aviation bureaus and gave them more autonomy in making operational decisions. During this period, however, CAAC continued to be the operator of all flights, all airports and the National Air Traffic Service.

The second stage began with the passage of "Report on Civil Aviation Reform Measures and Implementation" by the State Council in January 1987. The main goal of this reform program is to separate the regulator from also being the operator and to break the CAAC monopoly. More specifically, the program included: (i) simplifying the traditional four-level administration system for air transportation to a two-level system, the CAAC and regional civil aviation bureaus; (ii) establishing six state-owned trunk airlines based on the partition of regions; (iii) separating airport operations from airline operations; and (iv) easing market entry (Wang, 1989).

The new program was implemented initially within the Chengdu and Shanghai regional civil aviation bureaus, respectively. As a result, China Southwest Airlines, based in Chengdu, was established in December 1987. In the following June, China Eastern Airlines, based in Shanghai, was established. With the success of the Chengdu and Shanghai "test-run," the other four airlines were established: Air China (based in Beijing) in late 1988, China Northwestern Airlines (based in Xian) and China Northern Airlines (based in Shenyang) in 1989, and China Southern Airlines (based in Guangzhou) in 1991. These air carriers are profit-seeking units and are directly responsible for air services provision. Each decides its flight frequency and sales outlets, selects inputs (e.g., crew members, flight attendants and their employment and compensation contracts), proposes aircraft purchase and route entry, and makes other operational decisions.

With the establishment of independent airlines, the main task of CAAC is of regulation and coordination, such as issuing airline license, approving route entry and exit, pricing, designing strategic plans for the industry, issuing policies and regulations to maintain safety and to improve competition and efficiency, and negotiating bilateral air services agreements with foreign countries. CAAC was no longer the operator of air transportation, and the new role allows it to focus on designing efficient mechanisms to fulfil its regulatory function in adjusting and regulating the market.

Similarly, the main mandate of regional civil aviation bureaus is administrative, such as coordinating air traffic control and regional airport development.

As mentioned earlier, airports were operated by CAAC. One component of the second-stage reform is to separate airport operations from airline operations and decentralize airports. As an experiment to test the efficacy of the new policy, CAAC approved in October 1988 that the airport in Xiamen (one of the four Special Economic Development Zones in China) be transferred to the Xiamen municipal government including all the fixed and working capital of the airport and personnel, and be run by the local government. Other airports were decentralized gradually over the next several years while new airports were managed by local governments from inauguration.

Another important reform measure is to ease both market entry and route entry. For the former, the policy is to encourage local carriers entering the market. The local carriers were set up by provincial or municipal governments or by large enterprises. These non-CAAC carriers started to enter the industry in 1986. There are so far more than a dozen local carriers operating mainly on small regional routes.

As for route entry, CAAC simplified its approval procedure and in general encouraged carriers to open new routes. Here airlines, in consultation with airports, proposes their new routing plans and CAAC holds meetings every year to coordinate route entry among airlines. Although CAAC's approval is required for route entry, most of the airlines' requests seemed to get approved without much trouble.

#### **IV. AIR TRANSPORT DEVELOPMENT AND COMPETITION**

This section examines the impact of the reform on the growth and development of China's airline industry. In particular, the following aspects of the industry will be discussed: air traffic growth and route development, market structure, and airline operation and competition. Other aspects such as airline pricing and costs, revenue and financial performance, civil aviation investment (airport and aircraft fleet), and air safety will be discussed in another paper.

##### **4.1. Air traffic growth and route development**

As indicated earlier, the Chinese airline industry was stagnant in its growth prior to the airline reform but has grown tremendously since the reform. Tables 2 and 3 report data on, respectively, air traffic volume and number of routes over the 1950-94 period. Both the total tonne-kilometers and revenue passenger-kilometers performed in 1994 were about 20 times of those in 1978. The total number of routes in 1994 was more than four times the number in 1980 (4.0, 4.3 and 4.7 times for



**TABLE 2: Traffic Volume in China's Airline Industry**

Year	Revenue Passengers (million)	Cargo/mail Tonne	Revenue Passengers-km (million)	Cargo/mail Tonne-km (million)	Total Tonne-km (million)
1950	0.01	767	9.78	0.82	1.57
1955	0.05	4711	56.85	5.14	10.12
1960	0.21	31788	161.88	26.46	40.45
1965	0.27	27163	248.35	25.10	46.62
1970	0.22	36891	179.24	35.20	48.22
1975	1.39	46555	1538.54	60.16	171.81
1978	2.31	63815	2791.91	97.05	298.66
1980	3.43	88866	3955.52	140.60	429.35
1985	7.47	195059	11671.63	415.12	1271.02
1987	13.10	298758	18877.09	652.36	2028.33
1990	16.60	369721	23047.98	818.24	2499.50
1992	28.86	575269	40612.04	1342.40	4284.56
1994	40.39	829434	55158.02	1857.66	5841.22

Sources: Transport (1985-95).

**TABLE 3: Number of City-pair Routes in China's Airline Industry**

Year	Domestic	Regional	International	Total
1950	7	0	0	7
1955	15	0	1	16
1960	12	0	5	17
1965	51	0	6	57
1970	67	0	4	71
1975	128	0	7	135
1980	159	3	18	180
1985	233	7	27	267
1987	277	7	39	323
1990	385	8	44	437
1992	492	13	58	563
1994	630	13	84	727

Notes: Regional routes refer to routes connecting Hong Kong and a city in Mainland China.

Sources: Transport (1985-95).

**TABLE 4: Overview of Chinese Airline Performance, 1980-94**  
(Index 1980 = 100; the numbers in the parentheses are rankings in the world)

A. Passenger-kilometres Performed					
	1980	1985	1990	1994	Annual Growth 1980-94
Domestic	100 (18)	313 (9)	514 (7)	1488 (4)	21.3%
International	100 (60)	412 (34)	701 (31)	1287 (23)	20.0%
Total	100 (33)	339 (20)	562 (15)	1436 (8)	21.0%
B. Tonne-kilometres Performed (passenger, freight and mail)					
	1980	1985	1990	1994	Annual Growth 1980-94
Domestic	100 (17)	302 (9)	487 (7)	1396 (4)	20.7%
International	100 (51)	416 (33)	758 (28)	1577 (20)	21.8%
Total	100 (35)	338 (21)	572 (18)	1453 (11)	21.1%

Sources: ICAO (1981-95).

domestic, regional and international routes, respectively).

Table 4 shows this recent growth in the context of world aviation. In 1994 China ranked 8th (11th) in the world in terms of revenue passenger-kilometers (total tonne-kilometers) performed, compared with its 33th (35th) place in 1980. In 1994 China's domestic passenger-kilometers ranked 4th, behind the U.S., Russia, and Japan. Its annual growth rate during the 1980-94 period averaged around 21% for both domestic and international traffic. This rate was 4.3 times the world average.

The dramatic growth of the Chinese airline industry can be attributed to several factors: increased disposable income, more leisure time, developing trade and tourism, and the airline reform discussed above. For example, the real GDP has increased almost 3 times from 1980 to 1994, with an average growth rate of 8.7% per year, compared with that of 5.8% in 1970s and 4.0% in 1960s (Yearbook, 1995). Research on airline demand using data from industrialized countries has found that the income elasticity of airline demand ranges between 1.5 to 1.8.<sup>1</sup> This means that a 10% increase of nation income would increase demand for air travel by about 15% to 18%. The annual economic growth rate in China was 8.7% during the 1980-94 period. Even applying the high end of

<sup>1</sup> Oum, Gillen and Noble (1986), for example, estimate an income elasticity of 1.5 for business travellers and of 2.0 for leisure travellers, using a data set of 200 U.S. domestic routes in 1978. The mean estimate is about 1.7 given the business/leisure travellers mix in their data.

the income elasticity estimates to China would, thus, imply an annual growth rate of 15% for airline demand, which is still less than the actual rate of about 21%. This suggests that factors other than general economic growth may be at work. It would be very interesting to do further research to isolate the positive impact of the airline reform (the liberalization of regulations and aviation policies, etc.) on the industry growth. It is quite clear, for instance, that the government policy of encouraging both market and route entry has facilitated the large expansion of new routes and total traffic.

#### **4.2. Market structure and route concentration**

The breakup of CAAC into independent airlines and the entry of new carriers have significantly changed market structure. Before 1987 (the second-stage airline reform), the industry was a CAAC monopoly. Now the Chinese airline industry may be characterized as an "oligopoly." The market participants include ten CAAC carriers (carriers under CAAC) and more than a dozen non-CAAC carriers. Table 5 shows passenger traffic (including both domestic and international traffic) performed by the Chinese airlines in 1991 and 1994. As can be seen, the six CAAC trunk airlines controlled the majority of the market share. In 1991 the top three airlines, namely, Air China, China Southern and China Eastern, together had a 60% of the total revenue passengers performed while the other three trunk airlines had 26% market share. The remaining 14% traffic was supplied by four other CAAC carriers and more than a dozen local airlines. The dominance of the top three carriers was weakened: their combined market share fell from 60% in 1991 to 53% in 1994. The decline is due mainly to the growth of local, non-CAAC carriers: their market share rose from 7% in 1991 to 12% in 1994.

In fact, the rise of local carriers in China has been dramatic. As can be seen from Table 6, local carriers started to serve domestic routes in 1986 and regional routes (routes connecting Hong Kong and a city in the mainland of China) in 1987. After entry they grew quickly, especially in the domestic market with average growth rate 104% per year over the 1986-94 period, which was much higher than the growth rate for CAAC carriers. Note that services on the international routes are reserved only for the top three CAAC carriers.

As a consequence of the growth of local carriers, the 3-, 4- and 6-firm concentration ratios in the Chinese airline industry had been falling in recent years, as reported in Table 7. (The 3-, 4- and 6-firm concentration ratios are calculated as the sums of the market shares of the 3, 4 and 6 largest firms, respectively.) On the other hand the Herfindahl index, the sum of the squared market shares of all firms, stayed almost constant over the period. For illustration, the available figures for the U.S. airline industry were also reported. Although direct comparison is problematic, if we take these

**TABLE 5: Traffic Performed by China's Airlines**

Airline	1991		1994	
	Revenue Passengers (million)	Revenue Passenger- km (billion)	Revenue Passengers (million)	Revenue Passenger- km (billion)
<b>CAAC Trunk Carriers</b>				
Air China	2.90	8.10	5.37	11.79
China Southern	5.69	5.48	9.91	10.74
China Eastern	4.20	4.65	5.61	6.91
China Northern	2.00	2.98	3.59	5.41
China Southwest	2.06	2.77	4.38	5.85
China Northwest	1.58	2.11	2.10	2.74
Sub-total	18.43	26.09	30.96	43.44
Other CAAC Carriers	1.14	1.83	3.08	4.86
Local Carriers	2.21	2.26	5.35	6.86
Total	21.78	30.13	40.39	55.16

Notes: Other CAAC carriers are: Xinjiang Airlines, General Aviation Airlines, Yunnan Airlines, and Great Wall Airlines.

Local carriers are non-CAAC airlines which include Xiamen Airlines, Shanghai Airlines, Shichuan Airlines, Hainan Airlines, United Airlines, Shenzhen Airlines, Wuhan Airlines, New China Airlines, Zhongyuan Airlines, Changan Airlines, Fujian Airlines, Guizhou Airlines, Nanjing Airlines, and Sandong Airlines.

Sources: Transport (1992, 95).

**TABLE 6: Entry of New Local Airlines in China**

A. Revenue Passenger-km Performed (thousand)							
	1985	1986	1987	1990	1992	1994	Annual Growth
CAAC Carriers							
Domestic	5949	8301	10503	12197	21120	28212	18.9%
Regional	768	896	1008	1864	2779	2948	16.1%
Local Carriers							
Domestic	0	21	583	1259	2821	6242	103.8%*
Regional	0	0	52	140	126	116	12.1%**
B. Total Tonne-km Performed (million)							
	1985	1986	1987	1990	1992	1994	Annual Growth
CAAC Carriers							
Domestic	674.2	919.0	1172.3	1348.2	2338.8	3183.0	18.8%
Regional	90.6	103.6	118.4	214.4	323.9	358.4	16.5%
Local Carriers							
Domestic	0	2.0	51.4	103.4	265.8	593.0	103.7%*
Regional	0	0	3.7	7.6	7.1	6.7	8.9%**

Notes: \* Growth rates are over the 1986-94 period.

\*\* Growth rates are over the 1987-94 period.

Regional routes refer to routes connecting Hong Kong and a city in Mainland China.

Local carriers refer to non-CAAC carriers.

Sources: Transport (1986-95).

**TABLE 7: Firm Concentration Ratios in China's Airline Industry**

	1991	1992	1993	1994	U.S. 1990
3-firm Concentration Ratio	58.7%	58.8%	54.4%	51.7%	NA
4-firm Concentration Ratio	67.9%	68.4%	64.1%	60.6%	61.5%
6-firm Concentration Ratio	84.6%	82.9%	80.2%	76.7%	NA
Herfindahl Index	0.17	0.18	0.17	0.17	0.12

Notes: The 3-, 4-, and 6-firm concentration ratios are the sums of the market shares of the 3, 4, and 6 largest firms, respectively. The Herfindahl index, the sum of the squared market shares of all firms, ranges between 0 and 1.

NA: Not available.

Sources: Transport (1992-95).

figures at face value they suggest that the Chinese airline industry is slightly more concentrated than the U.S. airline industry.

It is often argued in the airline research that the markets at the city-pair level are more relevant for the purpose of competition and consumer welfare than the markets at the national level. Table 8 thus examines concentration at the 30 largest domestic city-pair markets in China, in descending order of market size. An equivalent number of firms is reported for each route. (The equivalent number of firms is the inverted Herfindahl index, calculated using each carrier's market share on the route). In 1993 there were, on average, 2.06 firms on one of the top 30 domestic routes. The number increased to 2.40 in 1994 (a 20% increase). The increase also occurred for both the top 10 and top 20 city pairs. These observations suggest that there were two or three "equivalent" carriers operating on busiest domestic routes and that concentration declined at the route level between 1993 and 1994.

#### **4.3. Airline operation and competition**

With the liberalization of China's airline industry, several trunk airlines and more than a dozen small local airlines have emerged, and airline network has expanded rapidly. The number of domestic, regional and international routes increased by an annual rate of 10.3%, 11.0% and 11.6% for the 1980-94 period, respectively (see Table 3). There were more than 600 domestic routes as of 1994, almost four times the number of routes in 1980. Moreover, the network pattern has fundamentally changed from a single airline, linear network to a local, "hub-and-spoke" system. The country has been decomposed into six air regions which correspond to the operational bases of the six

**TABLE 8: Concentration at the 30 Largest Chinese City-pair Markets, 1993 and 1994**

1993			1994		
City-pair	Passengers	Equivalent Number of Firms	City-pair	Passengers	Equivalent Number of Firms
Beijing-Guangzhou	907420	2.87	Beijing-Guangzhou	969751	2.52
Guangzhou-Shanghai	859876	2.86	Guangzhou-Shanghai	840961	3.40
Beijing-Shanghai	742683	2.11	Beijing-Shanghai	677707	2.40
Guangzhou-Haikou	521693	1.27	Guangzhou-Haikou	515944	2.15
Guangzhou-Guilin	503810	1.05	Beijing-Xian	501146	1.61
Beijing-Xian	476154	1.62	Guangzhou-Chengdu	493649	2.66
Guangzhou-Chengdu	439011	2.12	Guangzhou-Hangzhou	450909	2.83
Guangzhou-Hangzhou	418078	2.82	Guangzhou-Chongqing	438454	3.34
Beijing-Shenzhen	379833	1.80	Beijing-Shenzhen	419293	3.19
Beijing-Chengdu	344531	1.55	Beijing-Chengdu	406779	2.25
Shanghai-Xiamen	330272	2.41	Guangzhou-Wuhan	365573	2.00
Shanghai-Shenzhen	328973	3.54	Guangzhou-Shantou	353735	1.05
Guangzhou-Shantou	315867	1.00	Nanjing-Beijing	353004	2.17
Guangzhou-Xiamen	308342	2.43	Guangzhou-Guilin	334228	1.00
Beijing-Nanjing	306411	1.82	Shanghai-Shenzhen	331711	3.81
Guangzhou-Chongqing	300982	3.26	Dalian-Beijing	331418	1.89
Guangzhou-Kunming	293841	1.72	Hangzhou-Beijing	331135	2.29
Guangzhou-Wuhan	281408	1.37	Guangzhou-Xiamen	321365	3.05
Beijing-Hangzhou	269155	2.69	Guangzhou-Kunming	318955	2.21
Beijing-Dalian	257594	1.89	Shanghai-Xiamen	310201	2.70
Guangzhou-Nanjing	252592	2.44	Beijing-Shenyang	270628	1.85
Shanghai-Fuzhou	224252	1.61	Guangzhou-Nanjing	258030	2.48
Chengdu-Lhasa	210159	1.00	Shanghai-Wuhan	257096	2.84
Shanghai-Chengdu	204400	2.07	Shanghai-Fuzhou	255289	2.15
Shanghai-Xian	303165	2.41	Beijing-Harbin	254769	3.93
Beijing-Urumqi	191415	1.59	Beijing-Wuhan	240347	2.85
Beijing-Shenyang	179719	1.00	Chengdu-Shanghai	238830	2.19
Chengdu-Kunming	177325	2.98	Chengdu-Lasa	223151	1.00
Shanghai-Guilin	176606	1.86	Shanghai-Xian	211704	1.30
Shanghai-Wuhan	175220	2.50	Haikou-Shenzhen	209160	2.78
Average	353129	2.06	Average	382831	2.40

Notes: The equivalent number of firms is the inverted Herfindahl index, calculated using each carrier's market share on that route.

Sources: Transport (1994, 95), Timetable (1993, 95), OAG (1994).

trunk airlines. By centering in its hub city,<sup>2</sup> each trunk airline is a dominant carrier in its own region while competing with each other on routes linking major cities of different regions. For instance, China Eastern, a trunk carrier, competes with China Southern, another trunk carrier, on routes Shanghai-Guangzhou (respective hub cities) and Nanjing-Xiamen (inter-regional, non-hub cities). However, China Eastern is a dominant carrier on its intra-regional Shanghai-Ninbo route, competing only with Shanghai Airlines, a local carrier. The inter-regional routes which see competition between hub carriers usually are busy routes; they cover more than half volume of total domestic air traffic. As shown in Table 8 above, typically there are at least two "equivalent" carriers on those routes.

Competition of China's airlines is mainly in the domain of non-price aspects. (The prices of all domestic flights are still regulated and set by CAAC.) An important competitive device is a carrier's networking or route structure. In particular, a network which can offer more destinations and convenient connections has a competitive advantage. Although CAAC's approval is required for route entry, most of the airlines' requests seemed to get approved without much trouble. Another competitive device which carriers can use is flight frequency. A high flight frequency on a route can reduce passengers' schedule delay costs (load factor will fall, however) and thus improve service quality. Other competitive devices include: flight scheduling, safety, aircraft type, airlines' travel agents and reservation, marketing promotions, service quality (e.g., inflight services and meals), and flight punctuality.

Competition has played a positive role in the airlines' drive to maximize economic profits and/or minimize costs, reflected in the improvements in their financial performance and productivity. Competition is good for business; apart from forcing the players to be more competitive, competition can create demand. Many Chinese, for example, have yet to fly an aircraft, so flying is a novel experience for them. The entry of new local carriers in the late 1980s and early 1990s helped to fill that need especially for people living in remote areas.

Competition also plays an important role in airlines' adopting new technology and/or ensuring the efficient use of technology. This is achieved through a longer-term view of investment in technology and the principle of fitness survival. A necessary condition here is that the firm can retain profit and make its capital purchase decision. In the Chinese airline industry, observations suggest that now each carrier has greater incentives to acquire new and more efficient aircraft and to develop efficient compute reservation systems and hub-and-spoke delivering systems.

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<sup>2</sup> Beijing for Air China, Guangzhou for China Southern, Shanghai for China Eastern, Shenyang for China Northern, Chengdu for China Southwest, and Xian for China Northwest.



## VI. CONCLUDING REMARKS

The (former) centrally planned economies share at least one common feature with the market economies: the transport sector is one of the largest sectors of respective economy. It is no small challenge to understand the functioning of this vital economic sector in the transition process. In this paper I have described the dramatic airline expansion in China. This expansion is made possible, not only by China's general economic growth creating new levels of affluence and business travel, but also by its enterprise and regulatory reform focusing on economic incentives, corporate governance and competition. However, in more recent years traffic growth is probably more than matched by capacity, and rationalization of the industry has the potential to further improve efficiency while at the same time maintaining competition. Based on the Chinese experience in airline reform, two lessons may be drawn for general enterprise and industry reforms:

First, major carriers' attitude towards entry and competition is essential for the success of reform. This point is related to the role of economic/output expansion in the initial stage of industrial reforms. From the above discussions, we have seen that allowing (almost) free entry in air transport has had little adverse effect on state-owned companies. This is because there is enough business for everyone. Political pressure to restrict entry has consequently been limited and has been outweighed by the objective of creating competitive markets. This would then build the momentum for furthering the shift to unlimited competition and making it irreversible. As capacity becomes more adequate, however, coordinated efforts may be needed to limit the entry of inefficient carriers or to allow them to be merged with other carriers. Second, we need to examine the transitional industrial policies such as merger/competition policy in the presence of various imperfect markets (e.g., imperfect financial market). This approach will help re-focus our attention of enterprise reform from the enterprise *per se* to the surrounding industrial and market environment.

China, with a population more than double that of the U.S. and Western European combined, will undoubtedly play a more important role in world aviation in the future. The traffic growth rate for China will depend upon its rate of economic growth and, in turn, on its political evolution. The regulatory regime will continue to change to reflect these trends. These trends, and the aviation system arising from them, will contribute to bringing China and other nations closer together.

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THE ECONOMIC EFFECTS OF AIRLINE DEREGULATION AND THE OPEN-SKY  
POLICY OF KOREA

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# THE ECONOMIC EFFECTS OF AIRLINE DEREGULATION AND THE OPEN-SKY POLICY OF KOREA

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## 1. BRIEF HISTORY OF AIR TRANSPORT IN KOREA

From 1948 up to the year of 1969, Korean civil aviation industry had been negligible due to Korean War, political turmoil, and poor economic growth. During these years international air transport in Korea was serviced mainly by the foreign carriers of Northwest Air, Japan Air, and Cathay Pacific Air. But since 1969 when KAL(Korean Air Lines) was privatized, Korean civil aviation industry has developed very rapidly thanks to the successful growth of Korean economy and the active business of KAL.

During the twenty five-year period of 1970-95, the air transport market in Korea has considerably expanded at the annual growth rate of 14.2% on the domestic routes and 21.5% on the international routes (Table 1), while the annual economic growth rate of Korea was only 8.7%. Especially in the second half of 1980's, owing to the Seoul Olympic Games, the liberalization of overseas travel by the government, and the unprecedented economic boom, the air transport market has grown at the annual rate of 34.1% domestically and 18.7% internationally. The market share of Korean carriers on the international routes was above 60% in the late 1980's. After it decreased to 46.7% in 1990 due to the active frequency increase of foreign carriers, it increased significantly to 64.5% in 1995 due to the second carrier(Asiana Airlines)'s growth.

Table 1. The Growth Pattern of Scheduled Air Transport in Korea

	Domestic Passenger Traffic (thousand pass-km)	International Passenger Traffic (thousand pass-km)	Market Share of Korean Carriers on International Routes (%)
1970	257,341	457,633	-
1975	293,356	2,847,963	-
1980	502,158	10,158,300	-
1985	1,144,548	17,726,525	62.6
1990	3,913,595	35,942,957	46.7
1995	7,172,110	59,763,085	64.5
1970 ~ 95 annual growth rate (%)	14.2	21.5	-

Source : DOT, "Statistical Yearbook of Transportation,"

Note : Asiana Air started domestic operation in Dec. 1988, and scheduled international operation in Jan. 1990.

Now KAL ranks one of the biggest 15 airlines in the world, with 49 jumbos, 15,400 employees, and 4.3 billion dollars of operating revenue. This successful growth of KAL seems to be based upon the government policy of privatization in the early stage, the open-sky policy to promote the free competition with foreign carriers on the international routes, and the position of natural monopolist in the market of Korean travellers.

As the demand for air transport has increased by 90 times for the past twenty five years, the civil aviation industry of Korea comes to a big turning point in the late 1980's. In 1988 the Korean government started to deregulate the air transport industry, and licensed the second carrier AAR(Asiana Air Lines) to operate on the domestic route and the Korea-U.S. transpacific route. Since then the aviation industry has been maintained as a two-airline system with one major carrier and the other relatively smaller one. Now AAR occupies 31% domestic market share and its market share on the international routes is 31% of KAL's.

The backgrounds of this deregulation are: Firstly, the air transport market has become too big for single airline to operate monopolistically; secondly, at that time the government started to deregulate and liberalize all the sectors of the economy to promote efficiency; and thirdly, it was affected by the international trend of airline deregulation, particularly by the U.S. deregulation. While there are six other non-scheduled air service companies in Korea, their businesses have been negligible so far.

As a special case different from other countries like U.S. or Japan, the domestic market in Korea is not profitable at all. While KAL, the market leader, has suppressed the air fare to a low level, AAR, the follower, has experienced much difficulty in increasing its air fare high enough to cover the operating expense. This kind of pricing behavior can be observed sometimes in the market structure of Duopoly. With the high operating cost due to the absence of enough regional airport facilities and the subsequent low utilization of aircraft, this low air fare in domestic routes has driven them to accumulate big operating loss.

So the two carriers, both KAL and AAR, sought to expand their network to more cities overseas, and finally drove the government to announce "The Guidance Rule for National Airlines' International Operation" in Oct. 1990. This rule permitted KAL to maintain its monopoly position on the long-range international routes while giving priorities to AAR on the short-range international routes, and allowed double tracking on the high dense routes. In Aug. 1994, this rule was changed to "The Rule to Promote the Competitive Power of National Airlines." As this deregulation rule removed the restriction of forbidding AAR's long-range international operation, AAR could serve European and Australian cities. And it showed the standard of double tracking in numerical number. For example, the double tracking is allowed in the long-range routes when the annual demand exceeds 210,000 passengers, and in the short-range routes the demand for allowing double tracking is 180,000 passengers.

But despite of the active route expansion of AAR, the operating loss of AAR on both domestic and international routes weakened very much its financial position. This means that even if the frequency increase turned out very beneficial to the consumers, the negative producer surplus made the net effect

on Korea's welfare obscure and unclear. Now some critics address that the market size surrounding Korea is too small to have two profitable airlines. This is a background for the open-sky policy of Korean government.

Therefore, this study analyzes the economic effects of two-airline system which has been the biggest deregulation in the history of Korean air transport industry, and shows the prospects for the open-sky policy of Korea, which leads to bigger market size, more chances and threats to the air transport industry of Korea.

## 2. PERFORMANCE IN THE KOREAN DEREGULATION ERA

### 2.1 Yield

On the domestic routes the air fares had been strictly regulated by the government even after deregulation until 1991, because the government intended to control the consumer price index through fixing the transport fares. From 1992 to 1995 the air fares could not be changed in the duopoly market structure. In 1996 the market leader, KAL, lowered the domestic air fare by 5%, which was not understood as a measure for more profit, but as the policy of KAL's top manager to thank the customers for KAL's growth and prosperity. But the market follower, AAR, did not follow this kind of leader's predatory

Table 2. The yield of Korean carriers

		Yield on Domestic Routes		Yield on International Routes	
		current won/RPK	1985 won/RPK	current won/RPK	1985 won/RPK
1980		43.5	61.4	33.4	47.1
1984		61.5	63.0	49.1	50.3
1988		62.5	55.1	52.0	45.9
1991	KAL	79.2	55.5	56.3	39.4
	AAR	63.6	44.5	76.8	53.8
1995	KAL	80.4	45.7	53.6	30.5
	AAR	81.9	46.6	48.2	27.4
1980-88 annual growth rate (%)		4.6	-1.3	5.6	-0.4
1988-95 annual growth rate (%)		3.7	-2.7	0.4	-5.7

Source : Airlines' data

Note : 1) The data of 1980-88 are Korean Air's.

2) Annual growth rate was computed from KAL's data only.

behavior. Rather than that, AAR raised its air fare by 10% in early 1997 to widen their price gap to 15% now. Therefore, the air fares hardly represent the supply and demand circumstances in the domestic air transport market of Korea, and thus it is not likely to be meaningful to compare the domestic yields before and after deregulation.

On the international routes KAL's yield in both nominal and real terms had increased up to 1986 (Table 2). But since 1986 it has remained stagnant in nominal terms and decreased in real terms, partly because of the two airlines' competition, but mainly due to the significant growth of the foreign carriers' frequencies into Korea.

## 2.2 Departure Frequencies

Morrison and Winston(1986) and Oum, Stanbury, and Tretheway(1991) found that increased flight frequency was the most important source of welfare gain resulting from U.S. and Canadian deregulation. Table 3 reports the Korean carriers' average weekly departure frequencies of scheduled services and their available seat kilometers on both Korean domestic and overseas routes.

On the domestic routes average weekly departures and available seat kilometers had increased by about 16% annually between 1980 and 1988. Since 1988 the total frequency has increased by 16.6% annually and seat capacity by 19.8% which are higher than before. The growth of frequency and seat capacity after deregulation is due to the AAR's active operation on the domestic routes.

Table 3. Departure Frequencies and Seat Capacity of Korean Carriers

	# of Average Weekly Departure Frequencies		Available Seat Kilometers (thousand ASK)	
	Domestic	International	Domestic	International
1980	296	343	863,018	15,167,256
1984	499	386	1,448,954	14,120,783
1988	947	486	2,784,006	18,366,835
1991	1,710	698	5,799,799	26,241,327
1995	2,772	1,062	9,845,265	66,843,546
1980-88 annual growth rate (%)	15.6	4.5	15.8	2.4
1988-95 annual growth rate (%)	16.6	11.8	19.8	20.3

Source : DOT, "Statistical Yearbook of Transportation,"

Both departure frequencies and available seat kilometers in the international services show that the deregulation has the positive effect to the consumers. The welfare effect of the Korean carriers' capacity expansion on



the international routes will be pretty significant as far as Korean travellers, who occupy half of total international travellers, tend to prefer Korean carriers to foreign ones.

### 2.3 Productivity

Labor productivity (RTK per employee) increased at the rate of 4.0% annually from 1980 to 1988. Since 1988 the growth rate of labour productivity has become significantly higher than before (Table 4). This productivity growth in the deregulation era has been based on the efficient use of labor driven by scarce resource of air crews and wage hikes since 1988. The labor productivity of AAR has been increasing very rapidly since it expands the international network.

Hours flown per aircraft per year, as a rough measure of capital productivity, have increased a little bit since deregulation. The reason why the capital productivity has not been improved very much is because it is affected mainly by the number of possessed aircrafts, which is often determined by the financial condition rather than efficiency issue. However, the hours flown per aircraft per year of the new entrant AAR have increased very much as it expands operation.

Table 4. Productivity Indicators of Korean Carriers

		Labour Productivity (RTK per employee)	Capital Productivity (Hours flown per aircraft per year)
1980		200,143	2,888
1982		225,495	2,499
1984		249,562	2,692
1986		264,819	2,845
1988		273,307	2,749
1991	KAL	322,371	2,761
	AAR	98,058	2,727
1995	KAL	561,826	3,234
	AAR	492,795	3,308
1980-88 annual growth rate (%)		4.0	-0.6
1988-95 annual growth rate (%)		10.8	2.3

Source : Airlines' data

Note : Annual growth rate was computed from KAL's data only

## 2.4 Employment and Wages

Table 5 lists the number of employees and average wages of the two airlines. Total employment increased rapidly by 7.6% annually since AAR started its operation.

Since deregulation started, both nominal and real wages have increased very rapidly mainly due to the entrant's demand for experienced manpower of airlines. Real average wage per employee had increased steadily during the 1980-88 period at the annual rate of 6.0%. But it shows sharp increase after deregulation started despite of high consumer price hikes in 1990-91.

Table 5. Employment and Wages of Korean Carriers

		Number of Employees	Average Wage per Employee	
			current thousand won	1985 thousand won
1980		9,788	5,349	7,544
1982		9,786	7,186	7,785
1984		10,225	8,395	8,601
1986		10,493	10,700	10,409
1988		12,198	13,684	12,067
1991	KAL	14,221	22,471	15,736
	AAR	2,659	13,979	9,789
	Total	16,880	-	-
1995	KAL	14,738	35,261	20,046
	AAR	5,672	22,491	12,786
	Total	20,410	-	-
1980-88 annual growth rate (%)		2.8	12.5	6.0
1988-95 annual growth rate (%)		7.6	14.5	7.5

Source : Airlines' data

Note : The annual growth rate of # of employees was computed from the data of total employees, while that of average wage was computed from KAL's data only.

## 2.5 Carrier Profits

Table 6 indicates that KAL has been recovered from the recessions of early 1980's as years go by. In 1989 KAL showed the best performance in its 20 years' history. After deregulation started, the profitability of KAL was worsened to net loss in 1990 and consistently recovered since 1991. Although the recent low profitability is the general phenomenon in the world aviation industry due to the low demand, it can not be denied that the fierce competition between the

Korean carriers partly contributed to it.

The loss of the entrant was certainly caused by the huge initial investment on aircraft and labor. Although AAR is still below the break-even point, its profitability has been improved slightly since 1990.

Table 6. The Operating Revenues and Profits of Korean Carriers

		Operating Revenue (million won)	Operating Income (million won)	Net Income after Interest and Tax (million won)
1980		558,688	26,970	-30,202
1982		835,904	114,531	4,674
1984		985,558	105,250	3,912
1986		1,314,295	145,083	12,128
1988		1,541,929	118,456	26,457
1991	KAL	2,008,809	194,948	15,951
	AAR	210,408	-3,789	-35,573
	Total	2,219,217	191,159	-19,622
1995	KALL	3,379,879	291,558	105,886
	AAR	1,053,748	116,810	30,626
	Total	4,433,627	408,368	136,512
1980-88 annual growth rate (%)		13.5	20.3	-
1988-95 annual growth rate (%)		16.3	19.3	26.4

Source : Airlines' Annual Report

Note : Annual growth rate was computed from the data of the carriers' total amount.

### 3. MULTILATERAL LIBERALIZATION AND OPEN-SKY POLICY OF KOREA

#### 3.1 Multilateral Liberalization of ICAO and UR

In order to cross-subsidize the loss of domestic operation, both KAL and AAR have been eager to expand their international route network. This drove the government to take the policy of Open-Sky, which is in accord with ICAO's proposal for Open-Sky Policy.

In the 4th ICAO International Air Transport Conference in December 1994, the ICAO proposed very progressive and ambitious multilateral liberalization packages in the fields of market access, safe guards, carrier ownership and control, structural impediments, regulation environments, and doing-business issues.

Although most of the developed countries like U.S. and EU and Asian NIES'

are favor of the liberalization packages, the underdeveloped countries of Africa and Asia insist more precise measures on safeguards and safety nets which are the exception clauses for them. Especially their policies are split in the multilateral liberalization of market access which is the most controversial issue in the package.

Besides ICAO's proposal, they made some progress on multilateral liberalization in the air transport industry through UR negotiation. Since the issue of hard rights(traffic rights) has been dealt in the bilateral agreements, it could not be included in the UR negotiation. Thus they reached an agreement on only the issue of soft rights(business rights on auxiliary air transport industries) in December of 1993. In GATS(General Agreement on Trade in Services) of UR, the multilateral liberalization of the businesses of aircraft repair and maintenance services, sales and marketing of air transport services, and CRS(Computer Reservation System) services are included. The proceeding of the liberalization package of each country should be checked by UR(now WTO) in the period of 5 years at least.

### **3.2 Open-Sky Policy of Korea through ICAO and UR**

The policy of Korean government on multilateral liberalization of ICAO is "progressive liberalization". In the issue of market access, Korean government proposes progressive liberalization considering all the factors and environments in the world aviation market, and consistent screening and revision on the liberalization plan and program in the period of 3~5 years. Korea insists the need of yardstick for finding any anti-competitive behavior and restraining measures to induce fair competition in the air fare and capacity.

In the process of UR negotiation, Korean government promised the liberalization of the sales and marketing of air transport services and CRS services. Although these businesses have been open to foreign investment since 1995 as they promised in UR, the business of aircraft repair and maintenance services was not necessary to be included in the final table of permission in UR. But regardless of UR, this business has been open to foreign investment since 1997, following the policy of Korean government to open the trade in services for its own sake.

### **4. REGULATION ON FOREIGN INVESTMENTS IN AIR TRANSPORT INDUSTRY OF KOREA**

The foreign investments in Korea are regulated by the law of "Regulation on Foreign Investments in Korea" and "Law of Stock Trading". The industries in which foreign investment is restricted and the permitted percentage of foreign equity is found, are listed in the Regulation on Foreign Investments. The Law of Stock Trading regulates the permitted portion of foreign investment in the stocks listed on the Korea Stock Exchange. Besides these laws, "Law of Air Transport" is applied to the foreign investments in the air transport industry of Korea. But this law has the most deregulated clauses on foreign investments in air transport industry.

The current regulations on foreign investments in air transport and its auxiliary industries are listed in Table 7. The total foreign equity in the scheduled and non-scheduled airlines is permitted below 23% and the equity of

Table 7. The Current Regulation on Foreign Investments in Air Transport Industry

business	Law of Air Transport (A)	Regulation on Foreign Investments (B)	Law of Stock Trading (C)	current regulation (A+B+C)
scheduled and non-scheduled airlines	• permit foreign equity below 50%	• permit foreign equity below 20%	• new firm or new stocks in capital increase: permit foreign equity below 20% • old stocks in stock market: permit foreign equity below 23% • old stocks outside stock market: foreign investment is strictly prohibited	• new firm or new stocks in capital increase: permit foreign equity below 20% • old stocks in stock market: permit foreign equity below 23% • old stocks outside stock market: foreign investment is strictly prohibited
charter or lease services	• permit foreign equity below 50%	• open 100% to foreign investment	• new firm or new stocks in capital increase: permit foreign equity 100% • old stocks in stock market: permit foreign equity below 23% • old stocks outside stock market: foreign investment is strictly prohibited	• new firm or new stocks in capital increase: permit foreign equity 100% in capital increase, but below 50% in total equity • old stocks in stock market: permit foreign equity below 23% • old stocks outside stock market: foreign investment is strictly prohibited
auxiliary air transport industries	• open 100% to foreign investment	• open 100% to foreign investment	• new firm or new stocks in capital increase: permit foreign equity 100% • old stocks in stock market: permit foreign equity below 23% • old stocks outside stock market: foreign investment is strictly prohibited	• new firm or new stocks in capital increase: permit foreign equity 100% • old stocks in stock market: permit foreign equity below 23% • old stocks outside stock market: foreign investment is strictly prohibited

one foreign investor is regulated below 6% in stock market according to the Law of Stock Trading. But as the Regulation on Foreign Investments regulates the total foreign equity below 20% in the airlines, this is the actual limit of new foreign investment.

In the case of the airlines which are not listed in the Korea Stock Exchange, foreign investment is strictly prohibited, since the current law prohibits the foreign purchase of the stocks outside the stock market. But in the case of establishing new firm or capital increase, the foreign equity on the newly issued stocks is permitted below 20% as the same with the case of the listed airlines. And there is another measure of drawing CB(Convertible Bonds) to induce foreign capital.

In the business of charter or lease services of aircraft, which needs at least two registered aircrafts, they permit foreign investment 100% in capital increase, but regulates it below 50% of total equity because of the nationality clause on aircraft registration. The foreign investment in the listed stocks of this business is regulated below 23% in stock market as the same with the case of airlines.

In all the other auxiliary air transport industries like repair and maintenance services of aircraft, fuel supply services, air cargo handling and intermodal services, courier services, CRS services and catering services, new investment is 100% open to foreigners. But the regulation on foreign investment in stock market is the same with before, which means 23% for the maximum equity.

The remaining air transport-related services which are not open to foreign investment are the services of cabotage rights which mean aircraft operation on domestic routes and air traffic control services. The time schedule for raising the limit of foreign equity on scheduled and non-scheduled airlines above 20% is not fixed yet.

## 5. LESSONS FROM THE EARLY EXPERIENCE OF DEREGULATION AND OPEN-SKY POLICY

In the case of Korea, the problem of accumulating loss on the domestic routes in the duopoly system is not expected to be solved in the near future. Therefore, because the loss of domestic operation should be recovered from the profit of international operation, it is inevitable that only the carriers operating on the domestic routes should be permitted to operate on the international routes. This means that the present air transport industry in Korea has the nature of monopoly for the purpose of cross-subsidization.

The carriers' performance during the deregulation era is not very supportive to the present competitive system from the national viewpoint. In the domestic operation consumer surplus greatly improved through the rapid growth of departure frequencies and the low fare of KAL, while producer surplus was severely impaired by the operating loss of the airlines.

In the international operation consumer surplus increased through discount fares for sales promotion, decreasing yield and growing market share of the Korean carriers. But producer surplus either stagnated or decreased a little due to the operating loss and flat capital productivity, despite of the improved labour productivity.

At this stage, it may be too early for Korea to draw any meaningful conclusions on the economic effects of deregulation from the experience of such

a short period of deregulation. The main concerns of the present two-airline system are the accumulating operating loss of the new entrant and the worsening financial conditions of the incumbent, although it is undeniable that it contributed a lot to the consumers.

There are some policy proposals on how to reorganize the market structure and readjust the present competitive system in order to maximize the net benefits. First of all, the entry barrier into the domestic market has to be removed to promote the competition more and more. Because the domestic routes are not profitable with the present duopoly system and airlines' cost structure, the only carriers who are confident enough to cut down the operating costs will enter the market. However, in the international operation, there seems to be no room for Korea to have more than two scheduled airlines in the near future. Even with the two airlines, it is still questionable to make them compete freely on any international routes without government intervention on their route structure through route allocation.

It is unquestionable that Korea should have the open-sky policy to meet the growing demand of consumers and to support the network of the Korean carriers. In ICAO's multilateral liberalization, Korea has the position of progressive liberalization which stresses the importance of setting up the measures for fair competition, as long as the principle of equal participation and reciprocity is kept. In UR negotiation, Korea has opened the auxiliary services as much as the other countries. Recently bilateral negotiation on open-sky agreement is in progress between Korea and U.S. This is expected to widen the business opportunities of Korean carriers significantly.

As a part of industry-wide open-door policies to foreign investment, Korea has lifted the ban on foreign investment in most of the air transport and its auxiliary services and has widened the limit on foreign equity in the industry. Particularly foreign investment is permitted in the scheduled and non-scheduled airlines by 20%. In most of the other auxiliary services, foreign investment in new firm or capital increase is permitted up to 100%, although foreign equity is limited within 23% in stock market.

Up to now there is no significant inflow of foreign capital in airline businesses. And there is no direct investment or equity swap of foreign carriers with Korean carriers. But direct investment and building new firm of foreign capital tend to grow in the industries of intermodal services and courier services. In the near future it is expected to have active foreign investment in other auxiliary services of air transport in Korea.

In order to prepare for the more competitive environment in the open market of air transport industries, the Korean carriers are recommended to be included in the global airline system through marketing alliance or equity swap with other foreign carriers. This policy is necessary for improving efficiency in airline management and obtaining more business opportunities in the international market. The open-sky policy of Korean government is expected to continue to make Korean carriers competitive enough for foreign challenge.

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53-03

**Title:** "Open Skies" in India - Is the policy succeeding?

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**Abstract:**

With a "middle class" of 200 million people in a large country where travel between the major population centres by surface transport can be arduous, India has a potentially large domestic airline market. In the post-World War II period, India nationalised its airline industry into one international carrier, Air India, and one domestic carrier, Indian Airlines, but it began to relax these controls in 1986. Since then, a series of policy initiatives introduced what is proclaimed to be an "open skies" policy.

There has been no shortage of new entrants willing to add capacity into a system where supply-side constraints are regarded as the main impediments to a boom in airline travel. However, many of these new ventures have failed within a few years and the remaining carriers, including Indian Airlines, have had to increase fares in an attempt to improve their financial performance. Far from being an "open skies" environment, airline managers continue to be subject to formal and informal government regulations and government has introduced new taxes and increased charges for aviation services.

The result is an industry characterised by financial instability and low traffic growth. This paper documents the changes in the regulatory system and analyses the strategies adopted by the airlines. It is concluded that inappropriate policies are constraining development of the industry, particularly the requirement imposed by the Government for the airlines to allocate their capacity on a mix of profitable and unprofitable routes.

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## **Introduction**

More than 100 airlines entered the Indian airline industry after World War II (Brimson 1985) and the intense competition precipitated what might reasonably be described as "destructive competition". Tata, a diversified industrial group, owned the largest of the carriers, Air India, and this became Air India International as the Government nationalised the industry. Eleven of the remaining private sector airlines then were merged to form Indian Airlines and the scope for competition was removed. Air India's role was to serve international routes and Indian Airlines operated domestic services under the control of the Director General of Civil Aviation and the regulations set out in the *Air Corporation Act (1953)*. This framework remained unchanged until the late 1970's when there was mounting criticism that Indian Airlines was not promoting tourism and industrial development at the regional level. The Government's response in 1981 was to start a third-level, feeder airline, Vayudoot, but aviation policy was coming under increasing pressure.

With its 12 million passengers a year, the domestic Indian airline market is relatively small. However, there is potential for the industry to become one of the largest in the world behind the USA, Europe (in a single market), China and Japan. Key factors to consider are the sheer size of India, its prospects for economic growth, its strengthening business and tourism sectors, a more liberal approach to airline competition, and poor surface transport links. India has the world's second largest population in the seventh largest country, it is the fifth biggest economy and it has a pool of highly trained scientists, engineers and other technicians. In the longer term, the Indian airline network could have a strong mix of dense traffic routes with relatively long sectors.

The current population of India is approximately 880 million and the growth rate is 2.1 percent per annum. Bombay, Delhi and Calcutta each has more than 10 million residents while Madras, Bangalore and Hyderabad have close to 5 million people each. Another ten cities have more than one million residents. It has been estimated there is a "middle class" of between 20 and 58 million households able to afford consumer durables and potentially a target group for the airline industry. What is more, the trend has been for the proportion of households in the two highest income levels to increase (Ministry of External Affairs 1996).

When India gained independence in 1948 its economic strategy was based on the concepts of self-reliance and social equity. The Government assumed control over a wide range of industries through a process of nationalisation and licencing regulation while tariffs and import controls were used to erect barriers to external competition. However, the arguments for adopting the successful growth strategies of the East Asian economies had become compelling by the 1980's (Krueger 1995). The Government of India began to adopt a more outward-looking policy relying on international markets to provide technology and capital. Foreign exchange controls have been eased and market forces determine the exchange rate. Liberal and progressive policies have been adopted to promote competition and exports and the Government has invited the private sector to participate in the provision of necessary infrastructure, particularly in the energy, telecommunications and transport sectors. As a result of these reforms, India has moved

away from its dependence on agriculture and mining and now trade and services contribute 70 percent to the nation's gross domestic product. Throughout the 1980's, the economy grew by more than 5 percent per annum (Asian Development Bank).

Though the average per capita income for India is low, the increasing economic strength of a sizeable group of households with high incomes has raised expectations of strong growth in airline travel. It has been argued that the demand for airline travel is highly elastic with respect to income because travel by air is at an early stage in its product life cycle. Assuming an elasticity of between 1.56 and 1.75 (Gallagher & Jenkins 1996), the medium-term growth from this source alone would lie in the range 7.5 to 9 percent per annum. In addition, the Government's Tourist Action Plan aims to increase the number of international visitors from 1.6 million to 5 million a year. This Plan called for an 80 percent increase in capacity in the domestic market.

In other situations where airlines have been deregulated, air fares have tended to fall and there have been similar expectations in India. Gallagher & Jenkins (1996) argue that the price elasticity of demand would lie in the range of -2.0 to -2.3, again because the market is only just beginning to emerge and because there is a latent demand that has not been catered for in the past. These authors conclude that the effect of deregulation in reducing fares "... may prove to be the most important short-run determinant in generating new traffic". The reductions in air fares were assumed to follow from improvements in aircraft utilisation and from declining costs in a deregulated environment. The combined impact of higher incomes and lower fares was predicted to yield traffic growth of 9.7 percent per annum at least until 2001. At that stage, capacity constraints and a maturing market are expected to reduce the rate of growth. The Airport Authority of India is planning for growth of 10 percent per annum in domestic passenger movements through its terminals until 2005 (Bhatura 1996).

Despite these prospects Indian Airlines' traffic increased at only 0.9 percent per annum in the period between 1982 and 1996, although the average rate masks widely varying performance. Up until 1987-88, the carrier's passenger numbers had been growing at between 7 and 17 percent per annum, but thereafter traffic began to fall. A major problem resulted when an Indian Airlines' A320 crashed in 1990 and the Government grounded the remainder of the airline's A320 fleet during a ten-month investigation. The number of international visitors to India was growing relatively slowly and some of the blame for this was levelled at Indian Airlines. It had a reputation for lateness, for cancelling flights and poor customer service and the Government was under pressure to inject capital into the airline. Vayudoot had not solved the problems of providing access to tourist destinations.

Even before the problems with the A320 fleet, Indian Airlines was operating with a high and increasing load factor, reaching a peak of 82 percent in 1988-89. The argument that Indian Airlines lacked the capacity to cater for the growth in demand was gaining increasing credibility. Independent assessments estimated that the market would increase to around 25 million by 1995 if capacity restrictions were overcome and if services improved in a more competitive market (Louden 1993). This could have been achieved had growth rates of 10 percent per annum been maintained from the mid-1980's. Instead, traffic fell by one-quarter between 1987-88 and 1990-91 and to maintain the target of 25

million passengers in 1995-96, it would have required an average annual growth rate of 26 percent from 1990-91.

At the same time the International Monetary Fund and the World Bank were urging India to allow the private sector greater scope to compete in areas of the economy previously reserved for state enterprises. The Government responded in 1989 by announcing an "open skies" policy under which it would allow air taxi operators to begin scheduled services in competition with the national carriers. In addition, the Government stated its intention to privatise Air India and Indian Airlines by placing them under the Companies Act with subsequent sale in part or in whole. The Government has continued its reforms and now allows private sector airlines to operate scheduled services on the main trunk routes. Indian Airlines has been able to achieve marginal increases in passengers, but the growth has been taken up mostly by the new airlines. Collectively, the private airlines carried more than 40 percent of the total passengers in 1995-96 and the growth is beginning to exceed forecast rates for the first time since the early 1980's.

However, the changes in policy have not proceeded smoothly. The Government's approval for selected operators to begin scheduled jet services in 1992 resulted in raids on Indian Airlines' staff. It has been reported that 115 of Indian Airlines' 450 pilots resigned in the 15 months to June 1993 (Louden 1993) and the incumbent was forced to ground its B737-200 fleet for want of crews. The Government responded by trying to protect its carrier, but the momentum of competition continued amidst growing criticism of the nation's aviation policy. The World Tourism Organisation (1994) has rejected the claim that the Government has introduced an "open skies" policy. Others have described the industry as "chaotic" (Ballantyne 1996). Despite the promise of a new emerging market within a liberal competitive regime, the number of passengers is at least 50 percent below the level it would have been had the growth expectations been fulfilled. Many of the new entrants have failed and the remaining carriers are reported to be barely profitable, fares have increased and the Government has reversed its policy on equity alliances with foreign airlines. There is still a long way to go before India's airline industry is able to grow at the rates seen in other Asian economies such as China, Indonesia and Taiwan.

This paper documents the changes that have occurred in the regulation of the Indian airline industry in the past decade and assesses outcomes in terms of market growth, fares and changes in services. Claims that government-imposed costs and low fares forced on the airlines by the regulator are major contributors to the financial difficulties in the industry are examined. There is some support for these arguments, but the paper argues the key shortcoming of the current regulatory approach is the way in which the airlines are required to meet "community service obligations". This matter will need to be addressed for India to derive maximum advantage from aviation reform.

### **Regulatory changes - 1986 to 1997**

The approach to liberalising competition in the airline industry in India has been gradual and it is fair to say that policy has lagged behind the market, although this is hardly a phenomenon confined to India. The same claim has been levelled at the USA and Australia (Trent 1995, Hooper 1997) and it is a familiar pattern in the developing country context (Hooper et. al. 1996). Nevertheless, in India the Government commenced with minor

changes that were immediately under pressure and it so far has not been able to establish a sustainable regulatory and competitive environment.

In 1986 the tourism sector argued that there was insufficient capacity on some key routes and the Minister of Tourism and Civil Aviation responded by allowing private sector airlines to operate as "air taxis". A condition attached to the licences was that aircraft had to have at least 15 seats and no more than 50 seats. Furthermore, there was a requirement to use "expatriate funds" to acquire aircraft and air taxis were not permitted to plan any departures within 2 hours of an Indian Airlines or a Vayudoot flight. Though fifteen licences were issued (Mhatre 1994), there was continuing criticism of the lack of capacity on tourism routes. This led to the Government's announcement in 1989 that it was implementing an "open skies" policy according to which there would be a progressive relaxation of restrictions on the air taxi operators with eventual approval to provide scheduled services.

Eleven new applications for air taxi licences were submitted to the Director General of Civil Aviation and, in 1990, five airlines were given approval to commence. Fares continued to be regulated and the Government retained its controls over foreign investment in the airline industry. Also, air taxi operators were required to serve an equal number of flights on routes of less than and greater than 700 kilometres. Air Asiatic, based in Madras, imported a Boeing 737 to fly between Madras and Bombay, but it discontinued operations after only five months during which time it made 363 flights and carried 23,437 passengers. The other new entrants mostly operated smaller turbo-prop aircraft. By 1991 the policy was regarded as a failure (Malik & Malik 1996).

The fatal crash of an Indian Airlines' A320 aircraft in 1990 was a major setback for the carrier and for the Government, especially since the carrier's A320 fleet was grounded until a lengthy investigation was completed. The loss of a substantial share of the incumbent's capacity resulted in an urgent need for the private sector airlines to expand and there were clear signals that the Government would allow the private sector airlines to expand and to advertise scheduled services.

The commencement of East West Airlines in February 1992 marked the start of a new era. This airline was owned by one of India's largest travel groups and it had a major impact on the market with its seven B737-200's and three F27's. Its entry was assisted by a pilots' strike at Indian Airlines and East West carried more than one million passengers in 1992-93. One of the significant policy developments was that the air taxis were permitted to obtain up to 40 percent of their equity finance from foreigners. Jet Airways, also backed by a travel group, took up this option in 1993 with 20 percent funding from Kuwait Airways and 20 percent from Gulf Air. In the same period, the other significant airlines to introduce jet aircraft were Damania Airways and ModiLuft. By the end of 1993, 17 operators had been granted air taxi licences and another 20 had obtained preliminary approval and new entrants were serving 54 routes (Malik & Malik 1996).

The rapid expansion of the new entrants took traffic away from Indian Airlines and Vayudoot. Also, Indian Airlines was weakened through the defections of pilots and engineers to the new carriers while it faced continuing industrial strife. At one point, Indian Airlines had six of its 10 A310's unserviceable, and 12 of its 19 B737-200 and one-

third of its A320 aircraft could not be used (Ballantyne 1996). Vayudoot was reported to have made a loss of \$5 million US in the first five months of 1994 and the scope of its operations was reduced to the hilly regions of the north-east. This was a short-term measure and Vayudoot was folded into Indian Airlines in 1994.

The Government responded with a crack-down on the new entrants. Recruitment of pilots and engineers from Indian Airlines was prohibited, the air taxis were prevented from publishing their timetables, the requirement that the private sector airlines fly an equal number of routes above and below 700 kilometres was enforced, and the new entrants were denied permission to import any aircraft with 120 seats or more (Mhatre 1994). Indian Airlines ceased contracting out surplus engineering capacity to the private sector airlines and the new entrants have had difficulty getting adequate access to terminal facilities. The official position was that Mumbai (formerly Bombay) and Delhi airports were congested and were unable to cope with rapid growth in aircraft movements (Mhatre 1995).

The status of the new entrants was made clearer in 1994 when the Government repealed the *Air Corporation Act (1953)* and issued new guidelines for granting scheduled airline status. The Government argued that it needed to examine applications for licences on a case by case basis, but operators had to demonstrate a sound financial position, to have a minimum fleet of 3 aircraft and to show evidence of an appropriate maintenance organisation and training facilities. The former requirement to operate an equal mix of short and long routes was changed to a more explicit statement about which "social" and other low density routes were important to the Government.

The new regulations defined three types of routes. The first category was comprised of all of the main trunk routes. The "social" routes included the remote areas in the north-east, Jammu and Kashmir and the Andaman Islands, while the third category covered all of the other non-trunk routes. Each scheduled carrier flying Category I routes is required to deploy an additional minimum of 10 percent of that capacity (in terms of available seat kilometres) on Category II routes and 10 percent of the capacity on these routes is to be operated within those regions that have some of the least economic fares. In addition, the carriers have to provide a further 50 percent of their capacity on Category III routes.

The other major policy development in 1994 was the enactment of the *Air Corporations (Transfer of Undertakings and Repeal) Act* under which Air India and Indian Airlines became limited liability companies incorporated under the *Companies Act (1953)*. In the words of the Director General of Civil Aviation, the industry has been "demonopolised" (Vakil 1996). Air India's lack of aircraft capacity and its declining share of international traffic to and from India prompted the Government to give Indian Airlines greater access to regional, international routes where its aircraft were suitable. Though the possibility of merging the two government carriers has been raised on several occasions, so far this option has been rejected. Also, there has been no clear commitment to privatisation, a step that would be difficult to take while both carriers are performing poorly. In the period between 1990-91 and 1993-94, Indian Airlines incurred a series of losses amounting to more than US\$220 million (Director-General of Civil Aviation).

The status of liberalisation in India remains uncertain. The Government controls entry on a case by case basis and its refusal to allow the commencement of a new carrier jointly owned by Tata Industries and Singapore Airlines has been criticised widely (Ballantyne 1996). The new liberal policy is based mainly on guidelines that can be interpreted and changed easily without any forewarning (Malik & Malik 1996). During 1997, for example, the position on foreign equity injections by foreign airlines has been reversed and Kuwait Airways and Gulf Air have been instructed to divest themselves of their interests in Jet Airways, now the largest private sector airline. The Government levies heavy taxes on the airlines, it forces the airlines to cross-subsidise unprofitable routes, and it keeps the general level of fares down while protecting its own carrier. Under these difficult and uncertain conditions there has been a remarkably robust interest by the private sector.

### **New entrant and incumbent strategies**

The amount of aircraft capacity on offer has increased substantially as a result of the liberalisation policy, although one analyst has commented that there has been *...uncontrolled expansion, transforming a monopoly market into a chaotic free-for-all almost overnight. There are now seven scheduled private airlines, 18 non-scheduled operators and 27 others waiting in the wings proposing to enter the fray* (Ballantyne 1996). Consumers have a wider choice of airlines offering greater reliability and frequency, increased capacity, improved in-flight service and better passenger reservation and handling. However, the parlous financial state of the industry casts doubt on whether the momentum can be sustained.

In developed airline markets, the most successful entry strategy has been to capture market share with low fares and this requires a low-cost approach. In some respects the new Indian airlines did minimise their costs, they started with older versions of the Boeing 737 and they eliminated some training costs by poaching pilots, engineers and managers from Indian Airlines. There have been limits, though, to how far the low-cost strategy could be pursued. For example, the new airlines paid as much as five times the competing salaries in Indian Airlines in order to attract staff (Ballantyne 1996) and, in any case, the Government's embargo on further recruitment from Indian Airlines has put an end to that source of personnel.

The Government regulates fares and the scope to compete with discounts is very limited. Under these circumstances rivalry among the airlines is confined to service. The new entrants have been forced to commence with relatively small fleets and then have been expected to spread their capacity across different classes of routes. East West Airlines operated two different types of aircraft in order to get a satisfactory match of aircraft to routes of varying traffic densities, but this proved to be uneconomic in a small fleet. When NEPC took over Damania Airlines and renamed it NEPC Skyline, it retained the original NEPC as a feeder airline. Also, NEPC has taken over the management of UP Air, a regional carrier in the state of Uttar Pradesh. Jet Airways announced its interest in developing a relationship with a feeder airline, but the common approach has been to have a single type of aircraft in the fleet.

The option of building up frequency on a route before opening competition on other fronts has not been available to the new Indian carriers. The alternative has been to operate with

low frequency and a large network. Better service is achieved by motivating staff with higher pay and better conditions and by using modern aircraft. The most successful new entrant, Jet Airways, has a fleet of B737-400 aircraft. Punctuality and reliability are supported by these staffing and fleet strategies, but it appears that aircraft utilisation is lower in order to establish a good reputation. For example, Jet Airways describes in its in-flight magazine how it maintains its reliability and safety during the monsoon period by holding capacity in reserve.

Initially the new Indian carriers leased older versions of the Boeing 737, but many have been introducing the B737-300, -400 and now the -500 series. When these ownership costs are coupled with relatively poor utilisation resulting from operating constraints, the new entrants have not derived any significant advantage from this quarter. Given the uncertain state of the reform process, all of the new entrants have operated with leased aircraft. This has added to the financial costs of entering the industry, particularly since currency costs have increased as the Indian Rupee has been decreasing in value.

Access to sufficient capital resources is one of the key requirements for a new airline, particularly while establishing a place in the market. ModiLuft, Sahara India, and NEPC all have been backed by large industrial groups. Jet Airways is owned by a sizeable travel group, as was East West. Gulf Air and Kuwait Airlines each owns 20 percent of Jet Airways. Another potential entrant, Tata-SIA, would be owned by the powerful Tata Industries and Singapore Airlines. The proposal is to introduce 19 aircraft over a five-year period, but the Ministry of Civil Aviation has refused to grant a licence despite the Ministry of Finance's urging to approve the joint venture. The Ministry of Civil Aviation has taken the view that the domestic airline industry has too much capacity already and that there is no need for the new airline. Also, the Ministry's recent embargo on investment by foreign airlines has become a further obstacle to the Tata SIA venture.

The new entrants lacked adequate terminal facilities and each has invested in its own security systems and ground handling. Apron congestion at Bombay, New Delhi, Calcutta and Madras has posed a major problem. The Government now requires the airlines to park their aircraft overnight at the nearest designated airport rather than at their operational base and this is claimed to be a constraint on the adoption of hub-and-spoke network strategies (Vakil 1996). In 1996 the Government has taken steps to address these problems by adopting a "Tourist Action Plan" according to which it will upgrade existing airport facilities and build new airports (Mayes 1996). However, it is surprising the new entrants have not entered into some form of alliance to share some resources let alone to co-operate in a broader form of marketing alliance to achieve a more effective coverage of the Indian network with small fleets.

An additional factor affecting airline costs is a 117 percent surcharge on the price of fuel introduced by the Government during the Gulf War, the proceeds being used to subsidise energy costs elsewhere in the economy. This increased the price from 60-70 cents US per litre to around \$1.60 per litre (Prasad 1996). Although the airlines have been granted a dispensation to import their own supplies, customs duty and handling charges bring the costs up to a similar level. Added to this, airport charges are high and the airlines are required to collect a 15 percent tax levied on the passenger fare, the Inland Air Travel Tax. Several airlines have had difficulty in paying the tax revenue to the customs



authorities and at least two, ModiLuft and East West, have had their operations suspended at various times while they were in default.

The difficulties in reducing costs and the inability to compete on the basis of markedly lower fares prescribe the opportunities for the new airlines. The new entrants in India have based their strategies more on service and reliability and they have been able to capture market share as the incumbent has not been able to supply sufficient capacity to cope with a growing market. It is not clear that these are sustainable advantages as Indian Airlines has improved its service. Moreover, Indian Airlines has a much larger fleet and a more extensive network and its introduction of a frequent flyer plan in 1993 gives it a marketing strength. There are several extenuating circumstances that must be taken into account in assessing its past performance including having the main burden of providing services on the social routes. The grounding of its A320 fleet for ten months and shortages of pilots and engineers have been major constraints. At the same time, it has to deal with a large number of entrenched unions seeking to improve their positions in a changing environment. Salary increases have been approved and the airline has a strategy to deal with its shortages of pilots.

A major component of Indian Airlines' strategy is the commencement in March of 1996 of its own low-cost operation, Alliance Air. The aim is to keep overheads to the minimum and to use the older B737 aircraft from the Indian Airlines fleet. This has made it possible to recruit former pilots without having to deal with seniority issues when they re-entered Indian Airlines. Indian Airlines is disposing of any B737's not required by Alliance as it reduces the diversity of aircraft in its fleet. At the same time, the option of merging and privatising Air India and Indian Airlines has been re-evaluated. The current position of the Government is that both airlines will be kept separate, but the roles of the two airlines have changed. Air India is to focus on long-haul routes while Indian Airlines was granted wider access to regional routes. Previously, Indian Airlines had operated to other nearby countries in South Asia, but it was granted access to another 17 international routes stretching from the Middle East to Malaysia. Furthermore, there is a commitment to carry out joint marketing initiatives including code-sharing, joint frequent flier programmes and integrated reservations systems. As was the case with the incumbent carriers in the USA after deregulation, Indian Airlines is learning how to take advantage of its size.

## **Have the changes been successful?**

### ***Choice of airline***

There have been numerous attempts to establish new airlines, but the first to make a major impact was East West Airlines. It entered the market at a time when Indian Airlines had part of its fleet grounded and also suffered from industrial disputes. East West was able to expand rapidly and was the largest of the new entrants in 1993-94. Table 1 shows that Jet Airways, with its strategy of targeting the business sector with a high-quality service, has taken over the position as the largest private sector airline. M.G. Express entered into marketing and technical agreement with Lufthansa and renamed itself ModiLuft. It too expanded rapidly on tourist routes and shorter routes and was the third largest carrier in

1995-96. NEPC was operating as a regional airline with F27 aircraft and now has taken over Damania, renaming it NEPC Skyline.

**Table 1: New entrants**

Operator	1993-94	1994-95	1995-96	Share 1995-96
Jet Airways	665,749	1,239,819	1,606,819	30.9%
East West Airlines	1,055,177	1,041,587	941,157	18.1%
ModiLuft	296,933	575,348	858,429	16.5%
Damania Airways	395,514	672,160	690,840	13.3%
NEPC Airlines	78	220,561	456,215	8.8%
Sahara India Airlines	59,574	170,700	380,422	7.3%
Archana Airways			38,596	0.7%
U.P. Airways	13,890	35,609	32,802	0.6%
Others	22,074	23,291	199,420	3.8%
Total	2,508,989	3,979,075	5,204,700	100.0%

Source: Director-General of Civil Aviation, *Annual Reports*.

The impact the new airlines on service levels has attracted praise (Vakil 1996, Ballantyne 1996), but a measurable dimension of the approach to service is the frequency offered on key routes. One of the features of the Indian airline market is the concentration of traffic on a small number of key routes. Almost two-thirds of the total domestic passengers handled at India's airports is confined to Mumbai, Delhi, Calcutta, Madras and Bangalore and the next five largest airports bring the cumulative total to 80 percent. In view of this, the weekly frequencies are very low. Indian Airlines has five scheduled flights each day in each direction on its busiest route, Mumbai to Delhi. Jet Airways has targeted the densest routes and it has a higher frequency on this route than Indian Airlines. Table 2 shows Jet Airways has the highest frequency between Mumbai and Madras and it matches Indian Airlines on two other routes. On all of the other trunk routes, Indian Airlines dominates.

**Table 2: Weekly flights for top ten competitive routes (total both directions) - 1996**

From	To	Indian Airlines	Jet Airways	Sahara Indian Airlines	NEPC Skyline
Delhi	Mumbai	70	82	12	
Bangalore	Madras	42			15
Bangalore	Mumbai	42	28	12	28
Calcutta	Delhi	38	28		
Madras	Mumbai	34	42		12
Bangalore	Delhi	28	14	12	
Calcutta	Madras	28			14
Calcutta	Mumbai	28	28		28
Delhi	Madras	28		12	7
Bangalore	Calcutta	14	14		

Sources: Airline timetables - Indian Airlines, Jet Airways, NEPC Skyline and Sahara India Airlines.

Jet Airways' strategy of targeting the business travel segment has been a key consideration in its route planning. It has built up its frequency and confined its network to the densest trunk routes. The other new airlines have spread themselves more thinly. Table 2 indicates that Sahara Indian Airlines and NEPC Skyline do not even have return daily flights in many of the densest markets. Table 3 illustrates how each airline has configured its network to include the busiest airports. Out of the 20 possible direct connections between the five busiest airports, Indian Airlines offered 10 (7.4 percent) out of the total of 136 routes listed in its 1996 schedule. Jet Airways concentrated on just 7 of these routes, but this was a proportionately higher share of the 27 routes it served.

Table 3 shows that Jet Airways, more than any of the other carriers, has a network focusing on connections between the busiest airports. It is the only airline to have more than half of its routes with both of the connected airports in the top ten in terms of passenger movements and 93 percent of Jet's routes have at least one airport in the top 5. This evidence supports the complaint by Indian Airlines that it has the heaviest burden of serving the lower density routes despite the regulations on network coverage.

**Table 3: Percent of airlines' routes connecting top 20 airports by airline in 1996**

Airline	Both Airports In			At Least One Airport In			Neither in
	Top 5	Top 10	Top 20	Top 5	Top 10	Top 20	Top 20
Indian Airlines	7.4 [10]	22.8 [31]	31.6 [43]	74.3 [101]	77.9 [106]	85.3 [116]	14.7 [20]
Jet Airways	25.9 [7]	55.6 [15]	63.0 [17]	92.6 [25]	92.6 [25]	92.6 [25]	7.4 [2]
NEPC Skyline	12.2 [6]	26.5 [13]	36.7 [18]	83.7 [35]	83.7 [41]	85.7 [42]	14.3 [7]
Sahara	16.0 [4]	36.0 [9]	44.0 [11]	92.0 [20]	92.0 [23]	96.0 [24]	4.0 [1]

Sources: Director-General of Civil Aviation. Airline timetables - Indian Airlines, Jet Airways, NEPC Skyline and Sahara India Airlines.

Notes: Number of sectors in brackets. Airports are ranked in terms of passenger movements.

## **Fares**

In the USA, it has been estimated that deregulation resulted in a 22 percent reduction in real average air fares between 1978 and 1993 (Morrison & Winston 1995). In Australia, average air fares declined by almost 20 percent in real terms in the five years following deregulation (Australian Competition & Consumer Commission 1995). Moreover, discretionary travellers have been offered a wide range of discounts as the airlines have learned how to manage a larger portfolio of fares using yield management systems. In the USA, approximately 37 percent of passengers paid less than the average fare prior to deregulation and this has increased subsequently to 60 percent (Morrison & Winston 1995). In Australia, the average fare lies between 30 and 40 percent below the published economy fare on most routes (Australian Competition & Consumer Commission 1996). It has been the use of these promotional fares that has been largely responsible for the increase in traffic in competitive markets.

In contrast, liberalisation of competition in India has been accompanied by rises in the level of fares. Indian Airlines has increased its charges several times in the period between 1993

and 1995 and the private sector airlines followed suit. In less than three years, air fares had increased by 40 percent in nominal terms (approximately 20 percent in real terms). There has been a fundamental difference between the situation in India as it entered a more competitive era and the situation in developed airline markets. The evidence in the USA was that regulation resulted in higher costs and, when the airlines were able to compete on whatever terms they chose, the emphasis turned from service competition to price competition. In India, regulated air fares remain low. It has been claimed that fares are half the level of comparable air services in Europe even after allowing for differences in operating costs (Dasgupta 1995). If this is true, there is little scope for reductions in fares on the scale seen elsewhere

Table 4 provides comparisons of published economy air fares in India with the USA, Europe and Australia over comparable distances. Though account needs to be taken of the widespread discounting in developed, competitive markets, the claim that fares are very low in India does appear to have some basis. Since costs per passenger kilometre decline with distance travelled, it is not surprising to see that the fares per kilometre are higher on the shorter routes. However, the differential between the fares in India and in other countries is highest on short routes, India's air fares are relatively lowest in short-haul operation. Note that the average length of the 136 sectors listed in Indian Airlines' published schedule is 670 kilometres. The average fare across these sectors (unweighted by traffic volumes) was 12.5 cents (US) per kilometre in August 1996 with a standard deviation of 2.5 cents per kilometre.

**Table 4: Comparisons of published economy air fares -  
India, USA, Europe and Australia (\$US 1996 values)**

Region	Port (1)	Port (2)	Distance in kms (point to point)	Fares \$ US	Fares c/km (US)
India	Varanasi	Lucknow	236	37.86	16.02
	Bangalore	Madras	259	40.29	15.53
USA	Cleveland	Dayton	261	331.44	126.99
Europe	Birmingham	Edinburgh	251	178.84	71.25
Australia	Sydney	Canberra	236	115.22	48.81
India	Goa	Madras	713	85.04	11.92
	Ahmedabad	Delhi	727	80.38	11.05
USA	Detroit	St Louis	706	436.38	61.81
Europe	Rome	Munich	707	388.35	54.93
Australia	Sydney	Melbourne	707	201.23	28.46
India	Madras	Mumbai	996	100.75	10.12
	Delhi	Mumbai	1,084	106.64	9.84
USA	Houston	Kansas City	1,037	526.98	50.69
Europe	Glasgow	Frankfurt	1,082	422.03	39.00
Australia	Sydney	Hobart	1,040	254.10	24.43
India	Cochin	Delhi	2,001	209.95	10.49
	Delhi	Trivandrum	2,159	225.18	10.43
USA	Detroit	San Antonio	1,944	757.26	38.95
Europe	Athens	Paris	2,102	674.19	32.07
Australia	Sydney	Cairns	1,970	415.08	21.07

Source: Australian Competition and Consumer Commission (1995) and Indian Airlines' schedule (August 1996).

Notes: Fares published by the ACCC have been updated using movements in consumer price indexes and exchange rates published by the International Monetary Fund.

In the United States, deregulation had its biggest impact on the longer routes as fares adjusted to bear a closer relationship to costs. Table 5 presents an analysis of actual air fares in 1988 (expressed in 1996 values), ten years after deregulation, and the fares that would have been set were the regulated formula to apply (Pickrell 1995). As a point of comparison, the average of the fares for the Indian sectors in each distance category is presented. It is well-known that the formula applied by the Civil Aeronautics Board kept the fares low on the shorter routes. A similar situation occurred in Australia where it was accepted that fares on short routes needed to be reduced for the airlines to be competitive with surface transport (Gannon 1982). It is not surprising to find evidence that air fares on shorter routes in India are low relative to the costs involved.

**Table 5: Regulated and deregulated fares: USA and India**  
(Values expressed in cents per available seat kilometre in 1996 US values)

Distance (kilometres)	Actual US Fare	Estimate of US Regulated Fare	Indian Regulated Fare
Under 463	26	20	13
463 to 925	19	16	13
925 to 1850	15	13	11
1,850 to 2,800	11	12	10

Source: Pickrell (1995) and OECD *Main Economic Indicators*.

Note: Pickrell reported actual fares and estimated the regulated fare in 1988 in cents per mile. These values have been expressed in the table in 1996 cents using movements in consumer price indexes and exchange rates published by the International Monetary Fund and converted to kilometres.

A simple formula that has been used to calculate regulated air fares in the USA and Australia includes a flag-fall and a distance component. Though there is no similar formula published by the authorities in India, a least squares regression analysis of published economy fares reveals a model conforming to this basic relationship. The estimated model takes account of reductions on fares for remote routes. Also, distance is measured on a point-to-point basis whereas there are many airports served via other airports. A dummy variable accounts for higher charges on indirect routes. The following result was obtained:

$$\text{FARE} = 511 - 150 * (\text{REMOTE}) + 3.08 * (\text{DISTANCE}) + 149 * (\text{DIRECT})$$

(10.2)    (-2.4)                      (51.0)                      (2.2)

$$\text{Adjusted } R^2 = 0.96$$

Where

- FARE = published economy fare in Rupees  
DISTANCE = point-to-point distance in kilometres  
DIRECT = 1 if indirect service or 0 if direct service  
REMOTE = 1 if route is nominated as a "Type III route", otherwise zero

The formula indicates that fares increase by 3.08 Rupees (9.3 cents US) for every kilometre travelled. A similar approach applied to 1,000 heavily-trafficked routes in the USA resulted in a model with fares increasing at a constant rate with distance. A one percent increase in distance resulted in a 0.38 percent increase in the fare, but a one percent increase in traffic on the route resulted in a reduction of 0.48 percent (Morrison & Winston 1995). This indicates the importance of traffic density in the economics of airline operations, but competition was found to be an additional moderating factor in the USA. Using the model for Indian air fares, and evaluating this at the mean distance, it appears that a one percent increase in distance in India results in a 0.8 percent increase in fares. Given the predominance of short routes in the Indian Airlines' network and the higher costs per seat kilometre associated with short-haul operations, it is not surprising to generate this result. No data were available to test the importance of traffic volumes on Indian air fares, though the results reported above suggest it is unlikely this has had a significant influence on the regulated fares.

It appears that the average flag-fall is 510 Rupees (\$15.48 US). However, the fare is increased by 149 Rupees (\$4.51 US) when it is necessary to fly via another point and it is

reduced by 150 Rupees (\$4.55 US) when the flight is to a destination in the north-east, Jammu, Kashmir or the Andaman Islands. At the mean distance, these effects amount to a 5.8 percent increase and a 5.9 percent reduction in fares, respectively.

Jet Airways' published economy fares range from being the same as Indian Airlines' prices to 29 percent more on the 26 routes where it competed in 1996 and its average increase was 4 percent. In comparison, NEPC advertised economy fares that were 10 percent more than Indian Airlines' prices, ranging between 30 percent less to 80 percent more on the 30 routes where the two airlines were competing head to head. Jet Airways increased its business class fares by 15 percent early in 1994, but the differential with Indian Airlines' business class fares in 1996 was 8 percent. NEPC charged 10 percent more on average for business class than Indian Airlines. It has been claimed that the new entrants have greater scope for influencing the level of fares on routes that were not served previously by Indian Airlines. NEPC advertised 18 routes in 1996 that were not in the published tariffs for Indian Airlines. The average economy air fare charged by NEPC on these routes was 15 percent more than the level obtained from the regression model and the range was from 36 percent below to 77 percent above. This indicates there is some substance to the claim.

The scope for discounting so far has been limited, but in 1994 Indian Airlines introduced discounts of up to 10 percent for point-to-point fares and some airlines were offering a free return trip on selected flights in 1996. Jet Airways says it is not prepared to discount its fares (Vakil 1996). It is difficult to say whether the lack of discounting activity is a result of regulatory controls or the lack of rivalry among the airlines. One commentator, however, has accused the airlines of working together in "an apparent price-setting cartel" (Ballantyne 1996). The main support for this claim was the ready acceptance on the part of the new entrants to match Indian Airlines' substantial price increases. To be fair, though, this might be a reflection of the difficult economic conditions in the industry and the need to cross-subsidise unprofitable routes.

### ***Growth in the market***

Despite the regulatory changes and the dynamic conditions in the industry, traffic has grown slowly. Indian Airlines carried 3 million fewer domestic passengers in 1995-96 than it did in 1987-88. The private sector airlines, including scheduled and air taxi operators, carried 5.2 million passengers in 1995-96, a 43 percent market share. Table 6 shows that traffic levels fell until the air taxi operators were permitted to operate scheduled services and then the market increased by 40 percent in five years. In comparison, when Australia deregulated its airline industry in October 1990, the total number of domestic passengers was around 11 million a year but has since more than doubled in size. The Indian air travel market has fallen well short of expectations held for it when the Government first began to respond to criticisms of the policy a decade ago.

**Table 6: Passenger traffic task 1980 to 1995-96**

Year end March 31	Passengers (millions)				IA Market Share %	Change in Traffic %
	Indian Airlines	Vayudoot	New Entrants	Total Market		
1981	4.85			4.85	100.0	
1982	5.56	0.02		5.58	99.6	15.1
1983	6.15	0.08		6.23	98.7	11.7
1984	6.82	0.10		6.92	98.6	11.1
1985	7.91	0.20		8.11	97.5	17.1
1986	8.62	0.20		8.82	97.7	8.7
1987	9.18	0.30		9.48	96.8	7.5
1988	9.93	0.40		10.33	96.1	9.1
1989	9.54	0.45		9.99	95.5	-3.3
1990	9.39	0.14		9.53	98.5	-4.6
1991	7.47	0.44		7.91	94.4	-17.0
1992	8.31	0.30	0.03	8.64	96.2	9.3
1993	7.27	0.21	0.38	7.86	92.5	-9.1
1994	7.23		2.51	9.74	74.2	23.9
1995	6.90		3.98	10.88	63.4	11.7
1996	6.93		5.20	12.13	57.1	11.5

Source: Director-General of Civil Aviation, India, and various annual reports.

Note: Data to 1986 in calendar years, thereafter in financial years with year end on 31 March.

## **The Industry's financial difficulties**

Since the Indian Government allowed private sector airlines to re-enter the industry as air taxis in 1986, numerous applications have been submitted for approval and a number of these resulted in the formation of airlines with ambitions to become national carriers or even major regional, feeder airlines. Of airlines falling into this category, there have been some notable failures. East West Airlines, Damania and ModiLuft all managed to capture a significant market share and then have encountered severe financial problems. There have been reports that the net profits of these carriers was less than 3 percent of turnover in 1994-95 (Mayes 1996) and the new entrants have been struggling to survive.

East-West became the largest of the new entrants when the Government allowed the private carriers to operate on a scheduled basis. Its rapid expansion was a contributing factor in its problems, but having a mixed fleet of aircraft proved to be costly. East West suffered further problems when one of its aircraft crashed on a training flight and then it received adverse publicity when one its senior executives was murdered. However, "mediocre product and loose management" have been cited as the main reasons for the failure of the airline (Malik & Malik 1996). ModiLuft's problems resulted in a bitter public dispute with Lufthansa about the termination of a technical and management agreement. Again the airline's difficulties appear to have arisen from rapid expansion that stretched its capacity and on faulty strategy (Malik & Malik 1996). After moves to attract foreign investment into the ailing carrier came to nothing and NEPC's attempt at a take-over failed, ModiLuft ceased business in 1996.

Damania Airlines began in 1993 as a "business traveller's airline" with 3 B737-200 aircraft and in its three years of operation it carried close to 2 million passengers while incurring \$20 million US in debt. It pushed the barriers of in-flight service and had aircraft grounded



at one stage for flouting a government ban on serving alcohol to passengers during flights. As its debts mounted, its aircraft spent more time on the ground, but the main difficulties it faced were in meeting the Government's requirements to serve uneconomic routes. In 1995, Damania was taken over by NEPC and renamed as NEPC Skyline while the original NEPC with its 7 F27 aircraft was retained as a feeder airline operating on regional routes.

The new entrant presence in the market now is dominated by Jet Airways with NEPC/NEPC Skyline, Sahara India Airlines, a handful of regional airlines, and a larger number of air taxi operators making up the remainder. The incumbents also have had financial problems. Vayudoot's failure and mounting losses for Indian Airlines have been discussed above. The picture that emerges across the industry is one of poor financial health despite favourable conditions in the Indian economy. Analysts have assessed that the load factor required for an airline to break even in India ranges between 67 to 74 percent and a small change in load factor results in wide swings in profitability (Dasgupta 1995, Vakil 1996).

The airlines have complained that the Government's surcharge on fuel and its inland passenger tax raise costs unreasonably for a fledgling industry. Further criticism is levelled at the fares the airlines are constrained to charge (Dasgupta 1995). In 1994, the cost of fuel was 0.57 cents per available seat kilometre for the US airlines (Gallagher 1995). It is not clear what other costs are included in the category of "flight operations" for Indian Airlines, but these were 38 percent of the airlines' total operating costs and amounted to 1.99 cents per seat kilometre in 1994. The least squares regression model of fares reported above indicates that the price of air travel increases by 9.3 cents US for every kilometre travelled. In comparison, the costs of operating a new B737-400 on a route of 700 kilometres in Australia has been estimated to be approximately 6.8 cents US per available seat kilometre when expressed in 1996 values (Bureau of Transport & Communications Economics 1994). Low-cost operators in the USA such as ValuJet and Southwest Airlines are reported to have costs closer to 4.5 cents per available seat kilometre, but ValuJet had an average revenue per seat kilometre close to 9.3 cents (1996 values) while Southwest was earning about three-quarters this rate (Gallagher 1995).

Southwest Airlines, the most consistently profitable airline in the USA, is able to survive on average prices below those charged in India. What is different is that the Indian carriers have little scope to practice price discrimination using yield management systems. This prevents them stimulating growth in the price-sensitive segments of the market while charging higher fares to business travellers. The market could become larger and the airlines could use their aircraft capacity better if they were given greater scope to increase published fares and to use promotional discounts. Southwest Airlines has developed a strategic position in its markets with its high frequency and direct flights coupled with a low-cost strategy that maximises the utilisation of its fleet. The Indian carriers have tended to compete on the basis of service and they have not taken advantage of operational approaches used by low-cost carriers in other countries or of the hub-and-spoke systems that favour larger operators.

The Government has a strategy to upgrade its airports and this will overcome the physical, infrastructure constraints on the airlines (Bhatnara 1996). These problems will take time to resolve, but constraints imposed by the regulatory system can be addressed in the short-

term. As a measure of the cost to the airlines of the requirements on them to support community service obligation Indian Airlines claims to have only 20 routes that are profitable while the losses it incurred on social routes in 1985 was at least \$48 million US (Mayes 1996). A key difficulty for all of the airlines is the requirement to spread capacity across the three different classes of routes. Damania Airlines' problems were exacerbated when it was forced to conform to the Government's guidelines. East West Airlines operated turboprop aircraft along with its small fleet of jets and found it had a major problem in managing costs while trading frequency, load factor and consumer preferences for the jets operated by Indian Airlines on its social routes. It eventually grounded its F27's after incurring heavy engineering, maintenance and training costs. Jet Airways has succeeded by minimising its exposure to the routes with low traffic densities.

The new entrants face a difficult choice. They can risk punitive measures by not conforming to the regulations, they can operate a mixed fleet of aircraft with consequent inefficiencies and reduced flexibility in scheduling and marketing, or they can associate themselves with feeder airlines. There are signs that the feeder airlines are developing a capacity to respond and Indian Airlines has formed its own feeder airline. However, the new airlines have started with larger networks and with lower frequencies than would be likely under completely free conditions.

This means that the airlines are not able to exploit economies of traffic density that, in the USA, continue to be achieved up to 40 million route ton kilometres (Gillen et. al. 1990). Research into economies of traffic density in India would be useful, but it is likely that these would be fully exploited by the main carriers only on the routes connecting Delhi, Mumbai, Calcutta, Bangalore and Madras, if at all. Left to themselves, the airlines have a strong economic incentive to develop their networks in such a way that they would spread the fixed costs of entering new routes across a sufficient volume of traffic. The regulations on allocating capacity place severe constraints on this option.

All of these factors are resulting in lower aircraft and labour productivity than is achievable in other airline markets. Indian Airlines had a large workforce in 1993, 22,000 employees for its 7.2 million passengers. This represents a labour productivity result of 350 passengers per employee or 32,500 revenue passenger kilometres per employee, approximately 40 percent and 20 percent, respectively, of the rates achieved in the US domestic industry in the same year. The cost per seat kilometre for Indian Airlines was 5.83 cents and this compares with an average for the US industry in the same year of 5.03 cents (Gallagher 1995). It has been noted above that fuel costs are high in India, but maintenance costs also were one-third higher than the average for the USA on a unit cost basis in 1994 while sales and distribution costs were slightly lower in India. The higher costs of fuel and maintenance are compensated for by lower wages in India even accounting for the lower labour productivity.

It seems there is scope for the Indian carriers to exploit their low labour costs and to be competitive with low fares. However, the Government can improve the prospects of reducing costs by setting a more stable regulatory environment and by allowing the airlines greater commercial freedom to develop appropriate strategies for the nation's developing market. A fundamental problem is the Government's position with respect to the two categories of "social" routes. The low density routes tend to be relatively short and, as the

surface transport system improves, there should be less need to subsidise them. There is no good reason why such services would need to be subsidised for tourists. In the USA, there were similar concerns that small communities would suffer after deregulation but the experience was more frequent, propeller-driven aircraft replaced the larger jets (Pickrell 1995). The regional airlines have used aircraft appropriate for the low density markets and have given the small communities frequent access to hubs where connections can be made to larger carriers.

Undoubtedly there is scope for promoting smaller airlines to deal with the low density routes in India but there are some significant routes that are not of a short haul nature (eg Andaman Islands). The Government has drawn particular attention to the most needy areas as Category II routes. One of the approaches that could be taken is to provide specific subsidies for airlines operating these routes. This was the approach taken in the USA with its Essential Air Service programme according to which communities that could generate fewer than 40 passengers a day in each direction were eligible for financial support. The EAS programme has been modified on a number of occasions but will be withdrawn in 1998, 20 years after deregulation. In 1994, 300 communities were listed by the US Department of Transportation as eligible for EAS assistance but there were only 77 claimants and the cost of the programme was \$26.8 million Abbey (1995).

That the Government of India considers there are some regions that should receive subsidised air services is not in itself a problem, but the method of achieving this result is constraining the development of efficient networks and appropriate matching of aircraft to routes of varying densities. It is difficult for a regulator in low density markets to determine the optimal fares, aircraft choice and networks (Forsyth 1992). A better outcome is likely to be achieved by granting the airlines greater freedom to choose where and how they will operate and the ability to set fares in accordance with conditions in each market. This will mean that a mechanism must be found to provide direct subsidies for the non-economic routes. The Government could adopt the view that the subsidy should continue to come from other airline users and it could achieve this through some tax on passengers. Though there are some objections to cross-subsidies of this kind, there is a need for a thorough evaluation of alternatives to the current regulatory system.

## **Concluding comments**

India has joined the growing ranks of nations that allow competition in their domestic airline markets. However, its cautious approach has placed a premium on the protection of Indian Airlines and on the continuation of uneconomic services on social routes. Fares have increased and traffic has grown much more slowly than should have been expected given economic conditions. The tourism sector was a vocal critic of protectionist policies but ambitious plans to increase the number of international visitors requires further expansion in capacity and improvement in standards. India is capable of developing a large domestic air travel market but the financial problems faced by the airlines threaten to stall progress.

Though published fares appear to be low in India, airlines in other parts of the world are able to maintain profits with similar average yields. Unit costs do seem to be higher in India than in the USA but improved performance would allow the airline industry to

become more profitable. There does seem scope to improve labour productivity in Indian Airlines, though this is not as important as in other countries because of India's low wages and salaries. The serious problems faced by the airlines in matching aircraft to routes and developing strong networks with relationships between feeder airlines and trunk carriers is impeded because of the regulatory approach. It would be possible to devise an alternative system to give the airlines greater commercial freedom while raising sufficient funds to support a direct subsidy system for the social routes. There is scope for the performance of India's airline industry to be improved and there is a need for a thorough evaluation of alternatives to the current system.

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# **The Japanese Domestic Air Fares under the Regulatory Regime : What will be expected after the revision of current charging system ?**

by

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## **Abstract**

This paper statistically investigates the charging system of Japanese domestic air fares and predicts the effect of the revision of current system on the consumer's surplus. Using 222 cross section data of 1995, this paper unveiled that (a) the fares in the long haul markets were set higher regardless of the number of passengers, (b) in the outstandingly dense markets, the fares were set higher than the predicted full cost level, (c) however, in the thin and shorter haul markets, fares were a little lower. Considering the price elasticity of these three types of routes, this paper concluded that the reduction of air fares in the long haul markets (especially dense markets) to the "distance-proportional level" would lead to the substantial gain of consumer's surplus, and this would surpass the loss of consumer's surplus that might arise in shorter haul routes. There still remains substantial room for the Japanese government to improve the consumer's benefit without worsening, or maybe with improving, the status quo of the airlines.

## **1 Introduction**

The Japanese domestic air markets have been tightly regulated in terms of charging fares, frequency, entry, and exit throughout the era of so-called "Old regime (1972-86)" and that of "New Domestic Policy (1986- )". Recently, the threshold that regulated the

number of carrier in a route had gradually been lowered and finally it was abolished in April, 1997. On the other hand, the charging system of fares had hardly been revised prior to 1996 except for the slight changes in 1989 and 1990<sup>1</sup>. However, in May 1996, Ministry of Transport allowed each airline to freely choose to set the fare within a 25% range below a maximum fare and expanded the availability of discount fares, but actually, a number of normal fares of large markets were raised, so it seems that this “nominal” policy revision doesn’t necessarily work well<sup>2</sup>.

The primary purpose of the fare regulation has been to cross-subsidy the deficit-ridden local routes with trunk and other large local markets. This policy has enabled domestic airlines to expand route network without cutthroat competition, to protect profits for the reinvestment, and to maintain stable management of growth<sup>3</sup>.

Judging by this context, the fares of large and/or dense routes are set higher above the commonly assumed level, namely, “distance proportional” level, and consumer’s surplus in these routes have been converted to the compensation for the deficits that come about in thin and/or small routes.

This paper investigates in what kind of routes the fares are set higher than the “distance proportional” level, and then predicts how much consumer’s surplus will change

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<sup>1</sup> In these revision, the fares were slightly lowered in the across-the-board way because of the change of tax system. The fares of north and south bound routes, which had been set higher in order to offset the loss of revenue due to the irregular climate change, were also reduced.

<sup>2</sup> More detailed information about the policy of Japanese domestic and international aviation policy is depicted in Yamauchi and Murakami (1995) and Yamauchi and Ito (1996). In 1998, being allotted some slots in Sapporo, Tokyo (Haneda) and Osaka (Itami), the new entrants (Skymark Airlines and Hokkaido International Airlines) are supposed to operate in such a dense trunk route as Tokyo-Sapporo (about eight million passengers carried per year) by charging much lower price. This may stimulate the fare competition among airlines, but the frequency of these airlines will be much less than that of “Big 3 (Japan Airlines, All Nippon Airways, and Japan Air System)”, it is not sure whether these new entrants can survive the competition in these markets.

by rectifying the current charging system of Japanese domestic air fares. In order to do so, the next chapter does the preliminary analyses necessary for the consecutive researches. The chapter 3 depicts the procedure of analyses in the former half, and then constructs the models and derives the empirical results.

## 2 The Preliminary Analyses

### (1) The Structure and Variation of Japanese Domestic Air Fares

The Japanese domestic air fares except for those of commuter airlines are determined so that the total revenue from them will cover the total cost of each firm<sup>4</sup>. This doesn't guarantee that the revenue of each route covers its total cost. The art of charging each fare of a route is such that it is approximately proportional to the stage length, in principle. This method has been thought to most effectively wipe out the feeling of inequality or discrimination in pricing which consumers might otherwise have. However, the fares per distance actually vary among the routes, although we control the factors that cause the cost differences (for example, whether the fleet consists of turbo-prop aircraft or not).

In order to see to what extent the fares vary, this part regresses the fare per distance to the stage length, using the log linear form and introducing the dummy variables that reflect the cost difference among the routes. The longer the stage length is, the lower the fares per distance are expected to be, because the operating costs decrease as the stage length is longer, so the sign of the parameter of stage length is expected to be negative (i.e., the convex curve may be expected). The function to be estimated may be regarded as the different form of the average cost curve rather than the actual marginal cost curve of the domestic market, but has the same shape of the marginal cost curve, since the marginal cost of operation decreases as the stage length is longer. If the statistics of the estimated function should be substantially significant, it can be said that the domestic air

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<sup>3</sup> Yamauchi and Ito, *ibid.*, p.38.

<sup>4</sup> On the other hand, the fares of commuter routes are determined so that the revenue of each route will cover the cost of the route. Eventually, the fares per distance of commuter routes are set higher than those of trunk and local routes.



fares are set at “relatively” reasonable level, because they are construed as being charged like the way of marginal cost pricing, covering the total cost of operation.

The original form of the equation to be estimated is as follows.

$$\begin{aligned} \ln(P/DIST) = & a + b \cdot DOKINAWA + c \cdot DISLAND + d \cdot DEXP + e \cdot DNARR + f \cdot DTURBO + g \cdot DYS \\ & + h \cdot DTR + (i + j \cdot DOKINAWA + k \cdot DISLAND + l \cdot DEXP + m \cdot DNARR \\ & + n \cdot DTURBO + o \cdot DYS + p \cdot DTR) \ln(DIST) + \mu \end{aligned}$$

, where  $\mu$  is the error term,  $P/DIST$  is the round trip normal fare per distance of each route, and  $DIST$  is the stage length of each route. All the following variables are dummy variables.

• **DOKINAWA** : 1 for the routes serving Naha International Airport in Okinawa Island, and the others zero.

• **DISLAND** : 1 for the routes serving the isolated islands other than Okinawa Island, and the others zero.

• **DEXP** : 1 for the routes which can be regarded as competing with Shinkansen Express, (namely, for the routes along which Shinkansen serves direct service), and the others zero.

• **DNARR** : 1 for the routes where such narrow bodied aircraft as DC-9, MD-80s, B737, and A320 is mainly inaugurated, and the others zero.

• **DTURBO** : 1 for the routes where smaller turboprop aircraft with less than 30 seats is mainly inaugurated, and the others zero.

• **DYS** : 1 for the routes where YS-11 (64 seat configuration turboprop aircraft) is mainly inaugurated, and the others zero.

• **DTR** : The trunk dummy variable. 1 for Tokyo (Haneda)-Sapporo, Tokyo-Osaka (Itami and Kansai), Tokyo-Fukuoka, Tokyo-Naha, Osaka (Itami and Kansai)-Sapporo, Osaka-Fukuoka, Osaka-Naha, Fukuoka-Sapporo, Fukuoka-Naha, and the others zero.

The estimated results are shown in Table-1. The data are the cross section data in 1995, and the sources are *Jikokuhyo*, (Time Table monthly published by Japan Travel Bureau), 1995.10 and *Koku Yuso Tokei Nempo* (annually published operating data of airlines), Ministry of Transport, 1996.

As are expected, the parameter “ $i$ ” is negative and the fares of the Okinawa-bound and the isolated island-bound routes are lower than those in the other routes. In addition,

Shinkansen Express plays an important role as a competitor with airlines, for it keeps the air fares lower. In the routes where narrow bodied and turbo prop aircraft are inaugurated, the fares per distance decrease more substantially than those in other routes, as the stage length is longer.

Table-1 : The regression results of  $Ln(P_i/DIST_i)$  function

	a	b	c	d	e	f	g	h
Para- meter	5.310 (58.105)	-.100 (-3.906)	-.080 (-3.073)	-.105 (-3.452)	.642 (5.406)	1.046 (6.196)		-0.039 (1.255)
	i	j	k	l	m	n	o	p
Para- meter	-.180 (-9.292)				-.129 (4.969)	-.170 (3.924)	-.051 (6.585)	

Note : (1)estimated by OLS.  $\bar{R}^2 = .858$   $SE = .094$   $n = 222$

(2) "Variable decreasing method" is used for the choice of statistically significant variables.

(3) t-statistics is in parentheses.

(4) These routes are excluded from the data. (a) Commuter routes, (b) The routes serving in Narita (because passengers of these routes can be regarded as the international tourists), and (c) the routes not operated throughout the year.

Looking at the statistics, we find  $\bar{R}^2$  is not so large, even though this model introduces all the variables that reflect the cost difference. This means that the other factors than distance affect the art of pricing. We can regard each positive residual in this estimated function as the extra mark-up charged for the corresponding routes, while each negative residual is expected to stand for the extra discounts from the average cost level.

## (2) The Classification of Domestic Markets

As is shown in 2(1), there exists the diversity in the level of the air fares. As long as airlines can, although restrictedly, control the fares, they must have charged them depending on the factors of the market structure of each route such as the volume of demand(PAX), the price elasticity of demand, load factor(LF), and distance(DIST)<sup>5</sup>.

<sup>5</sup> From the viewpoint of the traditional industrial organization theory, the number of competitors affects the mark-up of the price. However, even though there are more than

This part of chapter 2 classifies 222 Japanese domestic markets into three groups each of which consists of the similar routes in terms of PAX, LF, and DIST by Ward method cluster analysis<sup>6</sup>. Figure-1 shows the result of cluster analysis (the tree of clusters), and Table-2 summarizes the character of each cluster.

Figure-1 The result of cluster analysis

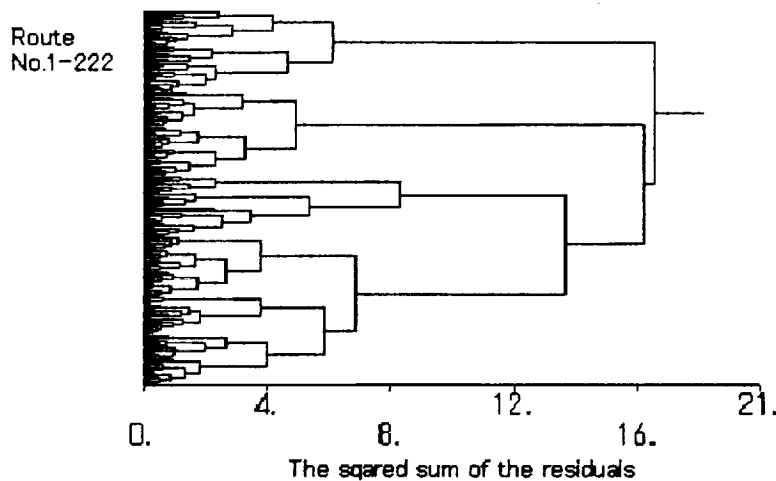


Table-2 The character of each cluster

	Average PAX(*1000)	Average LF (%)	Average DIST (Km)	Total PAX (*1000)
1 <sup>st</sup> cluster (n=114)	99.1	56.6	989.4	11294.3
2 <sup>nd</sup> cluster (n=50)	1136.8	60.5	861.1	56839.2
3 <sup>rd</sup> cluster (n=58)	148.0	63.2	276.3	8586.6

Note : Each cell shows the average value of each variable in 1995. The data source is *Koku Yuso Tokei Nempo* (annually published operating data of airlines), Ministry of Transport, 1996.

two airlines, they charged the same price under the regulatory regime prior to May 1996 (namely, at the time when the data to be used in the following analysis was collected) , so this case doesn't consider this factor.

<sup>6</sup> The information of the price elasticity of each route is hard to obtain, so this factor is excluded from this cluster analysis.

The routes in the first cluster can be described as long haul but thin and inefficient markets. The second cluster contains long haul and by far the densest markets of all, and the third cluster contains thin, short haul, and relatively efficient markets .

### 3 The Effect of the Revision of Current Air Fares : Empirical Analysis

#### (1) The Procedure

Using the cross section data introduced 2(1), the latter half of this chapter estimates the demand function of each cluster, and then derives the approximate changes of consumer's surplus if the art of charging domestic air fares is revised.

In advance of the empirical analysis, this part explains how the results of preliminary analyses of the last chapter are associated with the following analyses. The factors necessary here are :

- (a) the demand elasticity of each cluster,
- (b) the residuals obtained from  $Ln(P_i/DIST_i)$  function<sup>7</sup>,
- (c) and the data of passengers and fares.

The results of the previous chapter are used for (a) and (b).

It is convenient to complementarily use the designated marks in Table-3 to simplify the explanation of the procedure of the following analyses.

Table-3 The designated marks used in the procedure of the analysis

(A) the name of the group (cluster)	(B)the price elasticity of demand (absolute value)	(C) the sum of the residuals obtained from $Ln(P_i/DIST_i)$ function	(D)the total number of passengers	(E) the supposed conditions of each mark
$\alpha$	$\varepsilon_\alpha$	$SR_\alpha (> 0)$	$PAX_\alpha$	$\varepsilon_\alpha > \varepsilon_\beta$ $PAX_\alpha > PAX_\beta$
$\beta$	$\varepsilon_\beta$	$SR_\beta (< 0, \quad SR_\alpha + SR_\beta = 0)$	$PAX_\beta$	

<sup>7</sup> It goes without saying that the sum of all the residuals is zero, but those in each cluster is expected to be non-zero.

Suppose that there are two groups (clusters) of routes,  $\alpha$  and  $\beta$  (see row (A)), and that the absolute value of the estimated demand elasticity of the routes in cluster  $\alpha$  and  $\beta$  is  $\varepsilon_\alpha$  and  $\varepsilon_\beta$  respectively (row (B)). Also suppose that the sum of the residuals of each route belonging to cluster  $\alpha$ ,  $SR_\alpha$  is positive (this means that the fares of the routes in cluster  $\alpha$  are set relatively higher than the "distance-proportional" level), while  $SR_\beta$  negative (See row (C). Of course,  $SR_\alpha + SR_\beta = 0$ ), and that we call the total number of passengers of each cluster  $PAX_\alpha$  and  $PAX_\beta$ , respectively (row (D)). If all the conditions shown in row (E) are satisfied, namely, the price elasticity of demand of  $\alpha$  is larger than that of  $\beta$ , and total number of passengers carried of cluster  $\alpha$  is larger than those of  $\beta$ , the gain of the consumer's surplus by one percentage's fare reduction in cluster  $\alpha$  is expected to surpass the loss of consumer's surplus that may occur in  $\beta$  by the same percentage's fare rise.

Using three types of demand elasticity of each cluster stated in the last chapter, and the data of  $PAX_i$  and  $FARE_i$ , the next part predicts how much the consumer's surplus of each route would change by the revision of air fares, and finally figures out how much the total amount of consumer's surplus of Japanese domestic air markets would change, adding up the amount of change in consumer's surplus of each route. In the meantime of analysis, it is necessary to define at what level the fares should be set and by how many percentages they should be changed. This paper assumes the case of matching the current air fares with the level of the estimated curve of  $Ln(P_i/DIST_i)$  in 2(1), namely, the estimated average cost level. The way of calculating its ratio is as follows :

$$CR_i = \frac{\mu_i}{Ln(P_i/DIST_i)}, \text{ where } CR_i \text{ is the changing ratio of the fare of route } i, \text{ and } \mu_i \text{ is}$$

the residual of route  $i$  in  $Ln(P_i/DIST_i)$  function<sup>8</sup>. The way of charging air fares assumed here still guarantees that the airlines can totally earn profits in the domestic operation, and may give the passengers the feelings of equality of pricing.

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<sup>8</sup> For example,  $CR$  of Tokyo-Osaka(Itami) is about .017, so in this case, it is predicted how the 1.7%'s discount of the fare will increase the consumer surplus of this route.

The demand functions to be estimated in the following part is one of the three simultaneous equations : the others are the load factor and the fleet size function, respectively.

## (2) The Simultaneous Equation Model and their Empirical Results

This part starts to construct the simultaneous equation model and then goes on to the empirical analysis. The models to be constructed here explains the carriers' behavior under the condition where both fares and frequency are regulated in the short run. Taking this regulatory regime into consideration, this paper chooses the passengers carried ( $PAX$ ), the load factor ( $LF$ ), and the fleet size ( $FLT$ ) as the endogenous variables in the simultaneous equation model (with a bar over them). Thus the model consists of three equations. "+" and "-" are predictable sign of each variable.

$$(1) \quad \overline{PAX}_i = f \left\{ (+) \frac{P_i}{DIST_i}, (+) POP_i, (+) INC_i, (+) FRQ_i, (+) \overline{FLT}_i \right\}$$

$$(2) \quad \overline{LF}_i = g \left\{ (+) \overline{PAX}_i, (+) DIST_i, (+) HI_i \right\}$$

$$(3) \quad \overline{FLT}_i = h \left\{ (+) \overline{PAX}_i, (+) DIST_i, (-) FRQ_i \right\}$$

All the equations are over-identified, but meet both order and rank condition. The variables and their explanation are shown in Table-3.

Table-3 The explanation of the variables introduced in the simultaneous equation

Name	Sauce	Definition
$PAX_i$	(a)	The number of round-trip passengers carried in route $i$
$P_i$	(b)	Normal round trip fare of route $i$
$DIST_i$	(a)	Stage length of route $i$
$POP_i$	(c)	The square root of the product of the greater-area population of each origin and destination city served by route $i$
$INC_i$	(c)	The square root of the product of the disposable income of each origin and destination city served by route $i$
$FRQ_i$	(a)	The number of the total departure in route $i$
$FLT_i$	(a)	The average seat number of aircraft inaugurated in route $i$
$LF_i$	(a)	The average round-trip load factor of route $i$
$HI_i$	(a)	The Herfindhal index of each route $i$

Note : The data sauces are ; (a) *Koku Yuso Tokei Nempo*, Ministry of Transport, 1996 (b) *Jikokuhyo*, Japan Travel Bureau, March 1996, (c) *Chiiki Keizai Soran* (the handbook of statistics of regional data), Toyo Keizai Shimposha, 1996.

In the demand function,  $FRQ_i$  and  $FLT_i$  represent the service quality variables. The more the frequency increases, the more easily the passengers can prefer the favorite flights, so the frequency delay will decrease<sup>9</sup>. In addition,  $FRQ_i$  is expected to play the same role as  $FRQ_i$  in the demand function for the same reason.

The load factor function was introduced in Douglas and Miller(1974)<sup>10</sup>. The purpose of this function is to show how the quality competition affects the demand and supply balance. The fleet size function explains what determine the carrier's behavior of organizing their fleet in order to optimize the efficiency. Here ( $PAX$ ), ( $DIST$ ), and ( $FRQ$ ) are expected to affect the inauguration of aircraft, because the more the passengers increase and the longer the stage length is, the larger aircraft the carrier inaugurates, whereas the increase of frequency may curtail the size of aircraft under the condition that the market develops moderately. Because the empirical results of these two functions aren't directly concerned with the purpose of this paper, they are not shown here.

The summary of the price elasticity of demand of each cluster as well as the sum of the residuals of  $Ln(P_i/DIST_i)$  function is shown in Table-4. The 2SLS regression results of each demand function are shown in Table-7 - 9 in Appendix.

Table-4. The price elasticity of each cluster

	1 <sup>st</sup> cluster	2 <sup>nd</sup> cluster	3 <sup>rd</sup> cluster
The sum of the residuals of each cluster	.1546	-.2183	.0637
Price Elasticity of demand( $\epsilon_j$ )	-.8017	-.5409	-.5727

Note : all of the coefficients are significant at 1 % level.

Generally speaking, like the case of the US prior to the deregulation, the fares of longer haul routes (i.e., the routes in the 1<sup>st</sup> cluster) are set higher than those of shorter haul routes, for the sum of the residuals of the 1<sup>st</sup> cluster is substantially positive. In addition, as the absolute value of the price elasticity of demand of the 1<sup>st</sup> cluster is relatively larger than those of the others, partly because many touristy routes are

<sup>9</sup> See Douglas and Miller (1974a), pp.82-83, (1974b), pp.658-659, and Panzar (1979), pp.92-95.

<sup>10</sup> Douglas and Miller (1974a), pp.50-54, and (1974b), pp.660-663.

included in this cluster, so the consumer's surplus is expected, in average, to be substantially ameliorated by changing the current fare of the 1<sup>st</sup> cluster to the level of estimated average cost of each route.

On the other hand, the sum of the residuals of 2<sup>nd</sup> cluster is negative and the routes in this cluster are much larger than the others in average, so the revision of fares might lead to the substantial reduction of consumer's surplus of this cluster, even though the price elasticity is the smallest of all<sup>11</sup>. However, twenty one of fifty routes in 2<sup>nd</sup> cluster have the positive residuals, and many of them consist of such large routes as Tokyo-Sapporo or Tokyo-Fukuoka, it is not necessarily determined whether or not the revision of fares would reduce the consumer's surplus of this cluster. This reveals the opacity and inconsistency of the charging system of air fares under the regulatory regime : why the air fares are set higher or lower although the price elasticity of demand is the same and the number of passengers, distance, and the load factor don't differ so significantly within the cluster.

The price elasticity of the routes in the 3<sup>rd</sup> cluster is as small as that of the 2<sup>nd</sup> cluster, and the sum of residuals in the 3<sup>rd</sup> cluster is barely positive. This means that the revision of air fares in this cluster may not have much influence on the change of the consumer's surplus.

The change of consumer's surplus of each route ( $CCS_i$ ) is derived from the Marshall's manner of calculation:

$$CCS_i = CR_i * FARE_i * PAX_i \left( 1 - \frac{1}{2} CR_i * \varepsilon_j \right) \quad (i = 1, 2, \dots, 222, \quad j = 1, 2, 3)$$

Then the total change of consumer's surplus ( $TCCS$ ) is described as :

$$TCCS = \sum_{i=1}^{222} CCS_i$$

Table-5 lists the top twenty routes the  $CCS_i$  of which would increase by the revision of air fares and their predicted amount per year.

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<sup>11</sup> Many large business routes (e.g., Tokyo-Sapporo, Tokyo-Osaka, Tokyo-Fukuoka, etc.) are included in the 2<sup>nd</sup> cluster. This may cause the smaller price elasticity of demand of this cluster.



Table-5 The list of the route the  $CCS_i$  of which would increase by the revision of air fares

Route		The expected increase of $CCS_i$ (\$US*1,000)	Cluster No.
TOKYO	FUKUOKA	23287.67	2
TOKYO	HIROSHIMA	9787.84	2
TOKYO	ITAMI	9446.01	2
TOKYO	SAPPORO	7531.36	2
FUKUOKA	MIYAZAKI	7302.31	3
NAGOYA	SAPPORO	7022.30	2
TOKYO	AOMORI	6321.99	2
TOKYO	OKAYAMA	5199.41	2
TOKYO	TAKAMATSU	4746.22	2
TOKYO	TOKUSHIMA	3846.66	2
TOKYO	MISAWA	3586.74	2
TOKYO	KUSHIRO	3538.84	2
ITAMI	SENDAI	3527.98	2
KANSAI	OKINAWA	3335.43	2
ITAMI	SAPPORO	3113.12	2
KAGOSHIMA	FUKUOKA	3080.83	3
TOKYO	TOTTORI	2897.72	1
FUKUOKA	SAPPORO	2432.77	2
TOKYO	ASAHIKAWA	2367.83	2
TOKYO	OBIHIRO	2055.70	2

Note : In order to help both the Japanese and the others understand the amount easily, these are calculated supposing that 1 US dollar = 100 Yen.

What is the most apparent in this table is that seventeen of twenty routes belong to the 2<sup>nd</sup> cluster. This means that each airline exploits the consumer's surplus of long and haul and dense markets and derives its profit from there. In addition, Table-6 shows the change in consumer's surplus in each cluster and  $TCCS$ .

Table-6 The change in consumers surplus in each cluster and  $TCCS$

	1 <sup>st</sup> cluster	2 <sup>nd</sup> cluster	3 <sup>rd</sup> cluster	$TCCS$
Change in CS (*1000)	3324.49	4606.14	-976.84	6953.79

Note : \$1(US) = ¥100 is supposed.

If the art of charging fares is revised, the consumer's surplus of the 3<sup>rd</sup> cluster may decrease, but those of the 1<sup>st</sup> and 2<sup>nd</sup> cluster will increase much more substantially than that of the 3<sup>rd</sup>'s, so  $TCCS$  is expected to increase by more than 6.95 million US dollars.

However, it seems that the new art of domestic air fares initiated in May 1996 doesn't

necessarily improve this loss of consumer's surplus, for the fares were raised mainly in the route of the 2<sup>nd</sup> cluster type, while they were lowered in the local routes that serves the points in Hokkaido and Okinawa. Although each airline was allowed to discount the fare by maximum 25% off the normal fare after this policy change, the fares were raised in those markets whose residual in  $\ln(P_i/DIST_i)$  function is positive<sup>12</sup>. This policy change may have reduced consumer's surplus of those who purchase the normal fares, even though it gave all the passengers the impression that it would ameliorate the consumer's surplus<sup>13</sup>.

#### 4 Concluding Remarks

The analyses of this paper reveal the character of the charging system of Japanese

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<sup>12</sup> Speaking of the trunk routes except for those which serve Narita, six of thirteen routes (Tokyo-Sapporo, Tokyo-Osaka (Itami and Kansai), Tokyo-Fukuoka, and Osaka-Fukuoka) experienced the rise of fares by 5.56%, while the rest (Tokyo-Okinawa, Osaka-Sapporo, Osaka-Okinawa, Fukuoka-Sapporo, Fukuoka-Okinawa) benefited from the revision of air fares (the reduction ratio is 2.55%). Generally speaking, the long distance routes that serve Okinawa and Hokkaido (except for Sapporo) experienced the reduction of air fares, but it is apparent that the rectification of air fares aimed at increasing the benefit of the industry, not of the consumer, because it allowed for the rise of fares in "already lucrative" routes. For example, the correlation coefficient between the residuals in  $\ln(P_i/DIST_i)$  function and the rising percentage of the fares after the policy change in 1996 is  $r=.3615$  ( $t=6.710$ ,  $n=222$ ). This means that the airline can dig up all the more profits for the rectification.

<sup>13</sup> However, since the discount ticket for advanced purchase and frequent flyer program have been more and more available compared with the era prior to 1996, the well-informed consumers about the air fares has more and more come to benefit from the opportunities to purchase discounted tickets than ever. When we more precisely analyze the issue of the change in consumer's surplus after this policy change, it is prerequisite that we have the information about the ratio of discount ticket users in the total passengers.

domestic air fares and figures out the effect of the revision of the current fares on the consumer's surplus.

Under the regulatory regime, the charging system has not been transparent in dense long haul routes, while the higher fares were observed in many thin long haul routes. Speaking of dense long haul routes, it doesn't follow that the changing the air fares to the "distance-proportional" level would diminish the consumer's surplus in the cluster because the sum of the residuals are positive. The fares of such outstandingly large markets as Tokyo-Sapporo, Tokyo-Fukuoka, and Tokyo-Osaka, the three biggest routes in Japan, are charged higher than the average, and the fare reduction might significantly increase the consumer's surplus of this cluster.

As the fares of thin long haul routes are also higher and the price elasticity of demand is relatively larger in these markets, the fare reduction in these routes might lead to the amelioration of consumer's surplus. On the other hand, the fares of shorter haul routes are set lower in average, so the change of fares to the "distance-proportional level" would reduce the consumer's surplus of this type of routes. However, both the absolute value of the price elasticity of demand and the number of passengers of these routes are so small that the reduction in consumer's surplus is expected to be so subtle. Totally, the substantial increase of consumer's surplus in longer and dense markets would offset the welfare loss that might arise in shorter and thin markets, and total gain in consumer surplus would be more than 6.95 million US dollars per year.

Judging by the empirical results, the domestic air fare policy of Ministry of Transport prior to 1996 had been desirable for the industry in that it guaranteed the airlines positive profit, but had not been appropriate for consumers in that there must have existed the room for the amelioration of consumer's surplus. To make the matter worse, the consumer's surplus may have decreased all the more for the revised regime in 1996, because many of the normal fares of long haul dense routes were raised and airlines have sought to exploit more profits from long and dense markets. As stated in chapter 1, the greatest change in this minor policy revision was that Ministry of Transport allowed each airline to freely choose to set the fare within a 25% range below a maximum fare, but this doesn't have any actual meaning, because the airlines (especially Japan Airlines and All Nippon Airways) succeeded in raising the fares in "across the board" way in those markets

where the competition is supposed to take place, namely, in double and triple track markets<sup>14</sup>. Indeed, this negative welfare effect on consumer's surplus may have to be discounted to some extent, because the availability of discount tickets has been expanded, such as "advanced purchase (maximum 35-6% off in 1996)" that has the restrictions similar to those on US discount tickets<sup>15</sup> or the "domestic frequent flyer program" that has the meaning equivalent to the discount ticket. The problem might be less significant than this paper predicted so long as consumers can easily access these discount ticket, like the case of the deregulation in the US in which more and more passengers came to purchase varieties of discount tickets, although the inflation-adjusted normal fare level increased more than the pre-deregulation level. However, the availability of discount tickets is still limited in that the percentages of discount ratio are much smaller than those of the comparable fares in the US<sup>16</sup> or the domestic frequent flyer program is separated from the international one, because of the legal restriction (Premium Law) in Japan. There still remains substantial room for the Japanese government to improve the consumer's benefit without worsening, or maybe with improving, the status quo of the airlines.

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<sup>14</sup> However, it is interesting that the Japan Air System has not necessarily followed the pricing strategy of Japan Airlines or All Nippon Airways. For example, JAS set the fare of Tokyo-Sapporo at 2405 yen, which is cheaper than those of JAL and ANA by 20 yen. The reason why JAS did so is that it has to get over the disadvantage of departure time and the number of frequency. Although the difference of fare may be too small to attract consumers, this behavior is expected to promote the competition among airlines.

<sup>15</sup> See Yamauchi and Ito, op.cit., p.41.

<sup>16</sup> See Morrison and Winston (1995), pp.11-19.

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## Appendix

Table-7 The regression results of the demand function of the 1<sup>st</sup> cluster

	Parameter	SE	t -statistics
Intercept	5.790724035	.409208542	14.15103411
Ln(P/DIST)	-.801667139	.035706861	-22.45134743
Ln(POP)	.185516058	.009125844	20.32864734
Ln(INC)	-1.037882684	.044381706	-23.38537153
Ln(FRQ)	1.040781057	.003713439	280.27414500
Ln(FLT)	.257804675	.028687798	8.98656192
$\bar{R}^2$	.999088	SE	.020031

Table-8 The regression results of the demand function of 2<sup>nd</sup> cluster

	Parameter	SE	t -statistics
Intercept	-3.852078627	.044358380	-86.83992932
Ln(P/DIST)	-.540864647	.004902349	-110.3276567
Ln(POP)	.061188439	.001273337	48.05359535
Ln(INC)	.658586091	.008758088	75.19747682
Ln(FRQ)	1.136044828	.000897329	1266.029194
Ln(FLT)	.452044920	.003208703	140.8809035
$\bar{R}^2$	.999984	SE	.002617

**Table-9 The regression results of the demand function of the 3<sup>rd</sup> cluster**

	Parameter	SE	t -statistics
Intercept	2.114181438	.878835638	2.405661931
Ln(P/DIST)	-.572695102	.070766088	-8.092790211
Ln(POP)	.079043602	.014078107	5.614647090
Ln(INC)	-.720400828	.114293247	-6.303091819
Ln(FRQ)	1.139589356	.009988452	114.090685200
Ln(FLT)	.551558563	.059660055	9.245022647
$\bar{R}^2$	.99808	SE	.048164

Note : All the equations are estimated by 2SLS. N=222

# **THE COMPETITIVE POSITION OF AIRLINE NETWORKS**

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The contents of this paper is as follows. Firstly quality and frequency of direct as well as indirect connections are operationalized by variables indicating the 'connectivity' between markets. Secondly this concept is illustrated by introducing the so-called 'connectivity matrix', which is a simple statistical representation of the performance of any airport in the markets served from and via these airports. Before introducing this concept we have defined a study area, as well as a classification of five airport classes. The study area is Western Europe, consisting of Benelux, UK, Ireland, France, Germany, Denmark, Switzerland and Austria. The five airports classes are:

1. The 'mainports' in Western Europe:  
London Heathrow, Paris CDG, Frankfurt and Amsterdam
2. The 'secondary' airports in Western Europe:  
Brussels, Luxemburg, London Gatwick, Manchester, Dublin,  
Paris Orly, Lyon, Berlin Tegel, Munich, Copenhagen,  
Zurich and Vienna.
3. Regional airports: all other airports in Western Europe.
4. All other airports in Europe, outside Western Europe.
5. All airports outside Europe.

## 2. Operationalization of 'connectivity'

In this paragraph the concept of 'connectivity' is elaborated and operationalized. This has been done using the ABC World Timetables for 1994 and 1996. Many passengers make transfers at hub airports to their final destinations, even in case good direct connections are available. The choice passengers make is depending on the attractiveness of the available alternatives. Attractiveness is often expressed in utility functions, where variables like available frequencies, their travel times and fares are weighted. Other factors like comfort, loyalty to airlines, specific preferences for certain airports or airlines do also play a certain role. The latter ones are hardly systematically available and even difficult to measure, so we keep - when measuring the attractiveness of a certain alternative - the main ones: frequencies, travel time and fares. Fares on certain routes change sometimes by the day. Advanced yield managing systems, used by some major airlines, result in large differences of fares. So a systematic and coherent fare information system, representing the actual fares paid, is also not available. However there may be some systematics in fare differentiation. Fares on non-stop or direct routes are generally higher than on indirect routes between two airports. Fares on indirect routes are generally lower for online (or code-shared) connections than for interline connections. Fares on a route are generally lower if more competitors are operating on these routes. And finally fares are 'carrier-specific' and are depending on the ability of carriers to compete on fares. It can be concluded that fares are generally depending on the number of competitors on the route and the product characteristics, like travel time, number of transfers, kind of connection (online or interline) and the carrier operating on the route. So - although we have no explicit fare information - fare differentiation is taken implicitly on board when taking the latter characteristics as a proxy.



## 1. Introduction.

The competition between airports is an item that is frequently discussed. Often lists of airports ranked by total number of passengers, cargo or aircraft movements are used to describe competitive position of airports. Of course these are indicators, that have certainly relevance, but also the diversity of their networks and frequencies offered to main economic centers must be taken into account.

Statistics published by airports, international bodies and timetables published in ABC or OAG do partly give an insight view in this diversity. They often produce frequencies and/or traffic by 'flight stage' and these indicators are good measures for the diversity of the networks offered by the relevant airports.

Nevertheless, little is known about routes actually flown by passengers. Passengers may fly for instance from Amsterdam to London, but in many cases onward connections are made. The quality and frequency of those connections are not registered by regular statistics. Statistics register in these cases two separate trips, one from Amsterdam to London, and one from London to Vancouver for instance. But the quality and frequency of these indirect connections do contribute as well to the attractiveness and so to the competitive position of airports. Particularly regional airports and regional airlines are often marketing these aspects. Although for these airports only a limited number of direct connections to the larger airports in the region exist, we find sometimes timetables for these airports with many onward connections to all parts of the world. For airlines typical examples are Air UK and British Midland, who seek cooperation with larger airlines to attract additional passengers for onward connections. Finally also the larger airports and airlines are - although not uniquely depending on this - increasingly emphasizing connecting traffic. Examples are the operations of the USA hub-carriers, who have established intensive hub operations at hubs like Atlanta and Chicago. It will probably even increase in importance as mega-airlines will emerge who establish global networks via a limited number of hubs. All these aspects are relevant for the attractiveness and competitiveness of airlines and airports. For them this is crucial information, but we see still no consistent statistics that address these aspects, although some airports are conducting studies and enquiries to have some insight view in this field.

This paper is an attempt to provide some information concerning these aspects. The paper may help identifying the position of airports (and airlines) in the main markets within Europe and between Europe and other world regions.

The route characteristics mentioned have been operationalized in a variable indicating connectivity, expressed in so called 'connectivity units' (CNU's). This variable is a function of frequencies, travel time and the necessity of a transfer. We have argued above that also indirect connections (including transfers at other hub airports) contribute to connectivity of a certain airport. Travel times of indirect connections are generally longer, but the frequencies of indirect connections are generally much higher. And finally they contribute to a much more competitive environment on those city-pairs. For instance on the Amsterdam - Vancouver route with 4 direct weekly connections in summer 1996, many airlines offer indirect connections with a transfer at their respective hubs, with frequencies much higher than the direct ones, but of course with longer travel times. Therefore indirect connections have been included, of course with some allowances for connecting time. Only indirect connections with connecting time longer than 45 minutes have been included. The attractiveness of one single (direct or indirect) frequency is defined here as depending of the perceived travel time. Necessity of a transfer is considered to be incorporated in travel time. Additional time penalties for transfer time have however been included. Passengers generally perceive transfer time as more inconvenient than flying time, as additional risks exist of missing connections and loss of baggage. The transfer time, when transferring from one aircraft to another, has been triple counted, to calculate perceived travel time. We have chosen a factor of 3, after making a global check with actual route choices bases on passenger enquiries at Schiphol. We may however carry out further research on this issue. By triple-counting transfer time, the perceived travel time is longer than actual travel time for indirect flights. To account for perceived travel time for every single frequency a 'quality index' is defined that represents the loss of attractiveness due to extra perceived travel time on top of the normal non-stop travel time. In case total perceived travel time is equal (or even less) than the normal non-stop time on that route the quality index equals 1. This is of course often the case for non-stop flights. If total perceived travel time exceeds certain limits (defined as a function of non-stop travel time), this index equals zero, assuming that the attractiveness of those flights is none. In all other cases an interpolation is made, depending on actual perceived travel times. The normal non-stop time is calculated using the coordinates of the airports of origin and destination, from which distance can be derived. Assuming speeds and allowing some time for take-off and landing, 'normal non-stop times' can be obtained. Maximum perceived travel time (the limit beyond which the attractiveness is considered as zero) is determined as a function of non-stop travel time. For a one hour non-stop flight this time limit is defined at 3 hours, and for a 12 hour flight this limit goes as high as 24 hours. Note that even for city-pairs where non-stop flights are technically not possible (generally those over 14 or even 15 hours) still non-stop times have been calculated. Finally in determining quality indices, the kind of transfer (online or interline) has been incorporated to represent somehow the effect of fares. We have included only 'online' connections, including the connections where a code sharing is made. For those connections the fare setting is normally not based on the actual (longer) routes flown, but take into account the market circumstances that exist on the concerning city-pair. For 'interline' connections the fare setting is normally based on the actual routes flown and sometimes even two separate tickets have to be bought by the passenger.

Summarizing the following model has been applied:

$$\text{MAXT} = (3 - 0.075 * \text{NST}) * \text{NST}$$

$$\text{PTT} = \text{FLY} + 3 * \text{TRF}$$

$$\text{QUAL} = 1 - (\text{PTT} - \text{NST}) / (\text{MAXT} - \text{NST})$$

$$\text{CNU} = \text{QUAL} * \text{FREQ}$$

where:

MAXT = Maximum perceived travel time

NST = Non-stop travel time

PTT = Perceived travel time

FLY = Flying time

TRF = Transfer time

QUAL = Quality Index

CNU = Number of Connectivity Units

FREQ = Frequency

The model is illustrated in the next table, where an example is elaborated for performance of British Airways in the Amsterdam - Vancouver market. Based on the coordinates of both airports the (calculated) non-stop travel time is 9.78 hrs. The maximum travel time equals - applying the model - 22.17 hrs. All connections with longer perceived travel times, have quality indices, and so 'connectivity unit' levels equal to zero. Two connections did meet the criteria. Both connect at Heathrow, one as an online BA-connection and one as a code-shared BA/CP-connection. The quality indices and connectivity have been calculated applying the above model and may be found in the next table:

Connectivity of British Airways in the Amsterdam - Vancouver market (summer 1996)		
Non stop Travel Time (hrs.)		9.78
Maximum Perceived Travel Time (hrs.)		22.17
Carrier System	BA/BA	BA/CP
Origin Airport	AMS	AMS
Departure Time from Origin Airport	14:05	10:00
Arrival Time at Transfer Airport	14:15	10:15
Transfer Airport	LHR	LHR
Departure Time from Transfer Airport	16:15	11:55
Arrival Time at Destination Airport	17:50	15:00
Destination Airport	YVR	YVR
Flying Time (hrs.)	10.75	12.33
Transfer Time (hrs.)	2.00	1.67
Perceived Travel Time (hrs.)	16.75	17.34
Quality Index	0.44	0.39
Days of operation	1234567	12345
Frequency	7	5
Number of Connectivity Units (CNU)	3.06	1.95

Note that the online BA-connections (7 times a week) result in a connectivity level of 3.06. These connections are equivalent to 3.06 non-stop connections with travel time equal to 9.78 hrs. We have however only listed the British Airways connections here. In the next table an overview is given of all other carriers operating on this route.

Summary of Connectivity in the Amsterdam - Vancouver market				
Carrier	Route	Freq	Qual Ind	CNU
KL	AMS-YVR	4	1.00	3.98
LH/LH	AMS-FRA-YVR	7	0.59	4.10
BA/BA	AMS-LHR-YVR	7	0.44	3.06
BA/CP	AMS-LHR-YVR	5	0.39	1.95
NW/AS	AMS-SEA-YVR	7	0.21	1.49
DL/DL	AMS-JFK-YVR	6	0.05	0.29
NW/NW	AMS-MSP-YVR	7	0.04	0.29
UA/UA	AMS-ORD-YVR	7	0.01	0.07
Total direct		4	1.00	3.98
Total indirect		46	0.24	11.24
Indirect via Europe		19	0.48	9.10
Indirect via I.C.A.		27	0.08	2.14

Note that only KLM operates with direct flights on this route. Their 4 non-stop flights add to a connectivity level of 3.98, indicating a quality index very close to unity. Lufthansa is the second player on this route. Even with a transfer at Frankfurt, geographically somewhat outside the Amsterdam-Vancouver route, high quality indices are performed, indicating a moderate time loss Frankfurt due to transfer. The contribution in the total connectivity of the routes via the US-hubs is moderate. Although daily connections exist, the time loss at New York, Minneapolis and Chicago results in low quality indices, and so in low connectivity levels.

The Amsterdam-Vancouver market is an example, where many indirect connections can be made. The distance is long and between the two ends some main hubs on both continents (like London, New York, Minneapolis and Chicago) are located, via which these indirect connections can be made. Not all markets have these characteristics, as the following examples, represented in the next table, may illustrate.

Connectivity from Amsterdam in selected markets					
	LHR	MAD	JFK	YVR	SLC
Total direct	159	37	31	4	
Total indirect		11	72	11	9
via Mainports		4	54	9	
via Secondary ports		0	11		
via regional ports		0	1		
via other European ports		7	4		
via 'ICA' ports			2	2	9

Consider the Amsterdam-London (LHR) market. Many indirect connections can - theoretically - be made. However the (triple counted) transfer time increases the perceived travel time at least with 2.25 hours. The flying time of the two flights on top of these 2.25 hours lead to perceived travel times longer than the maximum travel time of about 3 hours. Therefore on this route no indirect connections, meeting the criteria are found. The total number of direct connectivity units equals however 159, equivalent to more than 22 non-stop flight daily. In applying this procedure, we may however have underestimated indirect connectivities in short distance markets with non stop time of - say - one hour, in case no direct flights are available. These connections do not meet the criteria, so they are left out by the model. However - as direct flight are not available - these short distance indirect connections may be the only alternatives for passengers. For these connections the coefficient of 3 for transfer time may be too high. Further research is therefore needed.

A second example is the Amsterdam-Madrid route. The distance is longer than the one from Amsterdam to London and indirect connections are found within the criteria, some via the Western European mainports en route and some via European airports outside the study area of Western Europe. Note that hardly any connections are found via secondary and regional airports in Western Europe. For the Amsterdam-New York market however, even via secondary airports in Western Europe connections are found. Increasingly the largest airports outside Europe, like New York, are connected not only by the 'big four' mainports, but also by secondary airports. This is however only the case for the largest airports outside Europe. 'Secondary destinations' like Vancouver are still connected only by European mainports or by the large hubs outside Europe. The last example is a destination like Salt Lake City. Although a domestic hub in USA, it is not directly connected to Western Europe. Therefore it can only be connected from Amsterdam via hubs in the USA.

### 3. The connectivity matrix

On the basis of the methodology elaborated above, we have assembled the 'connectivity matrix'. We have used Amsterdam as an example. For this airport the matrix is displayed in the table below.

Connectivity Matrix for Amsterdam (summer 1996)												
	Destination regions											
	Levels						Av.% growth 1994-1996					
	Total	M.Po	Sec	Reg	Euro	ICA	Tot	Mp	Sc	Rg	Eu	Ic
<b>Direct connections</b>												
No. of destinations	230	3	12	50	54	111	2	0	4	5	8	-1
Average frequency	14	102	40	22	13	6	5	2	5	4	1	6
Frequency	3235	305	479	1107	698	646	8	2	10	10	10	5
Average quality index	0.95	0.97	0.99	0.94	0.97	0.90	1	0	0	1	0	1
Direct Connectivity	3070	297	474	1041	675	582	8	2	10	11	10	6
Average distance (hrs)	2.94	1.14	1.35	1.21	2.41	8.87	-1	0	0	-2	1	0
Total 'CNU hours'	9025	339	639	1259	1625	5163	7	2	10	9	11	6
<b>Onward connectivity</b>												
Total	3181		1	9	296	2875	23		-13	20	19	23
via Mainports	572		0	6	57	510				374	17	6
via Secondary airports	232		0	4	76	152				-24	12	17
via regional airports	10				2	8					-51	-38
via oth. Euro airports	248				161	88					28	24
via 'ICA' airports	2117				0	2117						31
<b>Hub connectivity</b>												
Total	8497	38	176	582	787	6915	34	14	33	69	49	31
from Mainports	302		4	0	30	268	10		117		12	10
from Secondary airports	1310	3	25	59	84	1140	22	23	74	49	27	20
from regional airports	4317	1	48	99	436	3733	53		121	147	98	48
from oth. Euro airports	2568	34	100	424	237	1773	21	12	11	62	20	16
<b>Summary</b>												
Direct Connectivity	3070	297	474	1041	675	582	8	2	10	11	10	6
Onward Connectivity	3181	572	232	10	248	2117	23	7	14	-41	27	31
Hub Connectivity	8497	38	176	582	787	6915	34	14	33	69	49	31
Av. Onward Conn'ty	1.0	1.9	0.5	0.0	0.4	3.6	13	5	4	-47	15	24
Av. Hub Conn'ty	2.8	0.1	0.4	0.6	1.2	11.9	24	12	21	52	36	24

The upper part of the table is displaying the performance of Amsterdam as direct connections are concerned. In 1996 from Amsterdam 230 destinations are served directly (without necessity of a transfer) with an average of 14 frequencies per week. As distance increases the average frequency decreases. To the 3 Western European mainports the average frequency is 102 per week (over 14 daily), whereas to intercontinental destinations the average frequency is only 6 per week. Amsterdam is therefore serving 3235 weekly frequencies. There may be less departing flights, as more frequencies may be served with one flight. If intermediate stops are necessary, time loss is unavoidable, resulting in 'quality indices' less than unity. Nevertheless the average quality index for all frequencies is still 0.95, indicating that the overall time loss due to intermediate stops is small and most frequencies are served non-stop. Even for intercontinental destinations the average quality index is 0.90.

Multiplying the level of frequencies with the respective quality indices, the total number of direct connectivity units is obtained. This level can be interpreted as being equivalent to 3070 weekly non-stop departing flights. By multiplying connectivity levels with average distances (in non-stop hours) an indication is obtained of the total (non-stop equivalent) hours flown from the respective airport (in case of Amsterdam 9025 hours weekly), which is indicative for the total size of the network operated from the airport concerned. The right upper part may give an impression of the relative performance in the two year period 1994-1996 (expressed in average yearly % increases). Note that the total connectivity has increased by 8% annually. This growth is the result of a 2% yearly increase in the number of destinations, a 5% yearly increase in average frequency and finally a 1% yearly increase in average (time) quality. This overall picture differs however significantly between the route groups. There has been a considerable growth in new destinations on the European routes, whereas on intercontinental routes some routes have been suspended. There are nevertheless some underlying dynamics. Although the total number of intercontinental destinations has decreased, there have been opened 9 new intercontinental routes (among which Beijing, Memphis and Surabaya). The increase in average frequency we find in almost all route groups, although this effect is most predominantly on intercontinental routes.

#### **4. Onward Connectivity and Hub Connectivity**

The second part of the table displays the 'onward connectivity'. Particularly to intercontinental destinations connectivity levels via other hubs are high (2875) in comparison to the direct connectivity levels (582). The cases elaborated above for Amsterdam to selected intercontinental destinations have illustrated the wide variety of choices on top of the choice for direct travel. Note however that in the case of Amsterdam the majority of those connections lead via hubs outside Europe (2117 out of 2875). This is an important consideration for an airport. It means a relative strong position in the markets for those carriers who operate at the hubs outside Europe, relative to those carriers who operate at competing hubs in Europe. Consequently, there is a stronger emphasis on long range networks, relative to short range networks. The share of hubs outside Europe in the onward connectivity level has even grown in importance, regarding the average growth factors from 1994 to 1996 (31% for hubs outside Europe, versus 6% growth for the three competing mainports). The connectivity growth to intercontinental destinations via the three competing mainports (6%) is particularly relevant in relation to direct connectivity growth to intercontinental destinations (8%). Although the difference is small, it is an indication of the somewhat decreasing competitiveness in Amsterdam of the three competing hub-carriers at Heathrow, Charles de Gaulle and Frankfurt in relation to those carriers serving direct connections to intercontinental destinations.

Summarizing, we must conclude that the vast majority of connectivity growth is leading via hubs and not via direct connections. This is remarkable, as the phenomenon of 'hub-bypassing' is frequently emphasized, as being of increasing importance. The changes between 1994 and 1996 do certainly not confirm this at least for the Amsterdam case. We see this happening for almost all routes groups, particularly for the USA/Canada routes. We have analysed these routes from Amsterdam somewhat further, as these intercontinental routes seem to be the most important for the Amsterdam case. Four main route alternatives do exist to USA/Canada. Direct routes as well as routes via European mainports, secondary airports and finally via USA- (or Canadian hubs) itself.

Connectivity from Amsterdam to USA/Canada by Route by Carrier system, 1996											
Direct			via Mainports			via Second.airp			via TCA' ports		
		%			%			%			%
KL+	131	11	BA/BA	92	4	BA/BA	23	340	KL+/NW	1121	55
UA	19	18	AF/AF	48	5	SR/SR	14	36	DL/DL	309	-13
MP	19	6	LH/LH	43	-1	SK/SK	9	13	UA/UA	254	33
DL	14	-40	BD/UA	17	113	SN/SN	7	135	CO/CO	126	32
CO	13	8	BD/VS	9		LH/LH	6	9	NW/DL	43	
RJ	6	-7	BD/AA	6	-56	SN/DL	5	-7	NW/AS	19	
SQ	3	1	BA/UA	3		EI/EI	4	71	KL/AS	12	
Other	6	1	LH/CP	0		Other	6	-49	KL/US	9	-20
			Other	9	-39				SQ/DL	6	
									Other	8	
Total	211	2	Total	227	-2	Total	75	19	Total	1907	31

Consider first the direct routes. We see the KLM/Northwest-block (indicated by KL+) as the most important player on these routes. Their market share in direct connectivity has increased from 52 to 62% (131 out of 211 in 1996). But, although still small, the connectivity of United Airlines (UA) has gone up stronger than the one of KL+ (18% versus 11% for KL+). The declining share of Delta Airlines (DL), is caused by changes in statistical registration and not by a declining network quality. For some carriers we find in ABC cases where indirect connections have been considered as direct connections (indicated as 'plane changes at intermediate stops'). This effect is negligible if aggregates are considered, but it may show some anomalies if further desaggregations are analysed. This is the case for Delta Airlines, where we find in 1994 some of those 'plane changes' considered as direct connections, which have been left out in 1996.

The routes via European mainports are dominated by British Airways (BA), as may be expected regarding its geographical location. Nevertheless also the networks of Air France (AF) and Lufthansa (LH) have a significant share in these routes. Note finally the role of British Midland Airways (BD), as a niche player on the Amsterdam - Heathrow route, and acting as a feeder for the USA-carriers as American (AA) in 1994 and United (UA) in 1996.

Furthermore the routes via secondary airports have increased in importance when compared with routes via the traditional mainports. Particularly connectivity of British Airways (BA) has developed via London Gatwick, due to congestion at Heathrow.



Note finally the routes via intercontinental hubs and the significantly increased connectivity of the KL+/NW-system. With the 131 direct CNU's, an additional 1121 indirect onward CNU's can be realized. The average number of onward connections (the 'average onward connectivity') per direct connection of the KL+/NW-flights to USA/Canada is therefore 8.6. This is an indication of the 'onward connective power' of these flights. This 'onward connective power' in the USA of the KL/NW-flights may seem high. This figure has indeed gone up since 1994 from a level of 4.4, but is still small in comparison with these figures for United Airlines (13.4) or even Delta Airlines (22.1).

The third part of the table addresses 'hub-connectivity'. This refers to connections with European origins that can be made via the airport, in this case Amsterdam. Direct connections operated out of Amsterdam lead to a total connectivity level of 3070 CNU's. Flights into Amsterdam from other European origins, feeding into those direct connections, result in an additional 8497 CNU's via Amsterdam. Therefore out of every direct CNU, an additional (feeding) 2.8 hub CNU's can be realized. So the average number of hub connections (the 'average hub connectivity') per direct connection of all flights departing from Amsterdam is therefore 2.8.

Hub connectivity in Amsterdam is most predominant to intercontinental destinations. For intercontinental destinations the 'average hub connectivity' is even 11.9. Out of every direct CNU to intercontinental destinations 11.9 additional hub CNU's can be realized from other European origins (6915 hub CNU's versus 583 direct CNU's). This is an indication for intensive feeding operations from European origin to intercontinental destinations. More than 50% of these are originating in regional airports in Western Europe.

The right part may give an indication of the increase of hub connectivity since 1994. Overall hub connectivity has increased with 34% yearly, which is high in comparison with the increase of direct connectivity with only 8%. With a relative small increase in the actual network, a much higher increase in hub connections has been realized, indicating a further intensifying of hub connectivity.

## 5. Average Onward and Hub Connectivity

The last part of the connectivity matrix is addressing 'average onward and hub connectivity'. These indicators have already been defined above, but it is interesting to analyse them somewhat further, as they differ significantly between the various air services. Consider for instance these figures for the group of 'European Mainports'. They are analysed more in detail in the next table. Average onward connectivity is 1.9, indicating that for every direct CNU on the routes from Amsterdam to the three other mainports, an additional 1.9 onward connections can be made from those mainports.

Connectivity from Amsterdam to European Mainports, 1996						
Destination	Carrier	Connectivity Units			Averages	
		Direct	Onward	Hub	Onw	Hub
London Hrow	KLM	53		12		0.2
	British Airw.	46	194		4.2	
	British Midl.	59	38		0.6	
	Others	1				
Paris CDG	KLM	42		23		0.6
	Air France	42	161		3.8	
	Others	5				
Frankfurt	KLM	19	3	2	0.1	0.1
	Lufthansa	26	177		6.7	
	Others	4				
Total		297	572	38	1.9	0.1

Note however that onward connectivity is exclusively concentrated at those carriers operating at the three competing hubs, i.e. British Airways in London Heathrow, Air France in Paris CDG and Lufthansa in Frankfurt. On the other hand hub connectivity is exclusively concentrated at the carrier operating in Amsterdam (KLM). The onward connective power of all Lufthansa flights from Amsterdam to Frankfurt is strong, at least for the cases shown in the table. These flights arriving in Frankfurt connect very well to the departing Lufthansa (or code sharing partners) flights from Frankfurt, in such a way that on average an additional 6.7 connections can be made. Note that on the other hand the hub connective power of the KLM flights to Frankfurt is low. This is caused by the definition of the study area. As stated in the previous paragraphs, we have limited the study to departing flight from Europe only. For most flights originating anywhere in Europe with final destination in Frankfurt the maximum perceived travel time is lower than the perceived travel time in case of a transfer in Amsterdam. Therefore we do find a limited number of KLM-connections in Amsterdam with final destination in Frankfurt.

Although we have concluded that average onward connectivity of the Luftansa flights to Frankfurt is high, we find much higher averages for other carriers operating on flights out of Amsterdam, as next table may illustrate, where we have displayed the top-20 air services, as average onward connectivity is concerned. The daily Delta flight from Amsterdam to Atlanta has the strongest onward connective power. On average 36 onward CNU's are made. Note also the strong onward connectivity of the KLM/Northwest system at the three Northwest hubs Memphis, Minneapolis and Detroit. But even in Boston and Seattle many onward connections can be made.

Connectivity from Amsterdam to selected hubs, 1996						
Destination	Carrier	Connectivity Units			Averages	
		Direct	Onward	Hub	Onw	Hub
Atlanta	Delta	7	251	4	36.0	0.6
Memphis	KLM/NW	7	210	104	31.2	15.4
Minneapolis	KLM/NW	14	397	275	28.6	19.8
Detroit	KLM/NW	19	485	354	26.2	19.1
Chicago	United	5	123		23.6	
Washington D	United	7	117	5	17.0	0.7
Houston	Continental	6	80		13.5	
Seoul	Korean Air	3	32		10.6	
New York JFK	Delta	7	65	5	9.4	0.7
Boston	KLM/NW	7	60	80	8.6	11.6
Kuala Lumpur	Malaysian	2	20	1	8.4	0.3
New York EWR	Continental	7	61		8.2	
Frankfurt	Lufthansa	26	177		6.7	
Bangkok	Thai Airways	4	20	2	4.9	0.4
Seattle	KLM/NW	4	19	14	4.8	3.5
Bahrain	Gulf Air	1	3	0	4.3	0.2
Los Angeles	United	4	19	1	4.3	0.2
London Hrow	British Airw	46	194		4.2	
Singapore	S'pore Airl	7	27		4.1	
Paris CDG	Air France	42	161		3.8	

In general onward connectivity is concentrated at those carriers operating at competing hubs. Hub connectivity is concentrated at those carriers operating as 'home-carriers' in the airport itself (in this case KLM in Amsterdam). We see this confirmed in the previous examples. Therefore most flights have feeds at only one side: the hub of the operating airline. The exception however is showed by the KLM/Northwest system. These transatlantic flights are operated in code-sharing agreements. Onward connections in the USA are made by Northwest Airlines and the feed into Amsterdam is made by KLM. Therefore those flights have connections at both sides, making them attractive for many European origins as well as USA destinations. The KLM/Northwest-flights to Minneapolis for instance make on average 28.6 onward connections possible to USA-destinations in Minneapolis as well as 19.6 feeding hub connections out of European origins in Amsterdam.

Although the 'hub connective power' of the KLM/Northwest flight to Minneapolis may seem high, we find much higher averages for KLM flights to other intercontinental destinations out of Amsterdam, as next table may illustrate. The daily flight to Bangkok for instance shows an average hub connectivity of even 33.3, indicating that for every KLM-flight to Bangkok an additional 33.3 connections can be made from European origins via Amsterdam to Bangkok. So many arrivals from European origins connect very closely to the flight departing to Bangkok.

Connectivity via Amsterdam to selected destinations, 1996						
		Connectivity Units			Averages	
		Direct	Onward	Hub	Onw	Hub
Bangkok	KLM	7		233		33.3
Tokyo	KLM	5		156		31.1
Hong Kong	KLM	5		146		29.7
Bonaire	KLM	3	0	84	0.1	29.5
St. Maarten	KLM	2		59		29.3
Toronto	KLM	9		257		28.5
New York JFK	KLM/NW	14		387		28.0
Kuala Lumpur	KLM	3		83		27.8
Paramaribo	KLM	3		83		27.7
Vancouver	KLM	4		109		27.2
Houston	KLM/NW	7		191		27.2
Caracas	KLM	5		133		26.6
Osaka Kansai	KLM	7		183		26.6
Rio de Jro	KLM	3		78		26.0
Mexico C'ty	KLM	4		101		25.7
Kilimanjaro	KLM	2		51		25.3
Aruba	KLM	8	0	192	0.1	25.3
Abu Dhabi	KLM	3		76		25.3
Lima	KLM	3		63		25.1
Manila	KLM	2		55		24.8

Note that these top-20 destinations - as average hub connectivity is concerned - show practically no onward connectivity, as at these KLM-destinations neither onward KLM/NW-flights, nor onward flights of code-sharing partners do exist.

Note finally that hub connectivity is predominantly concentrated at intercontinental destinations. Perceived travel times of connections from European origins via Amsterdam (or any European hub) to other European destinations, are generally too long in relation to the non-stop travel time, at least when applying the above defined model. This model may however - as stated before - not be realistic for indirect intra-European connections, in case no direct flight is available. Particularly KLM has been succesful in connecting intra-European flights, but the model is probably attributing too high penalties for transfer time in these cases.

## **6. Conclusions**

The analysis made above may have given an impression of the connectivity performance of Amsterdam Airport. We have shown in this paper only the analysis for Amsterdam, as the purpose of this paper is illustrative. These analysis however may be shown for any airport in Western Europe. Further on dynamics in connectivity may be further elaborated.

Developing these connectivity indicators may enable airlines and airports to identify their position in the own networks and in relation to competing networks. Further research is however necessary. Utility functions have to be developed further, in order to relate connectivity more closely to actual route choice.

This analysis may be helpful for airlines and airports in identifying their market position and assessing alternative marketing strategies. These alternative strategies may be addressed in the framework of emerging alliances, codesharing agreements and network globalization. Another application may be to evaluate effectiveness of rescheduling to improve connectivity.

## **Air Transport and Regional Economic Development in the European Union**

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The general objective of this paper, which concentrates on scheduled passenger air services, is to discuss the European Union's (EU) aviation liberalisation policy within the specific context of the variable economic performances and potentials of regions. Almost all previous discussions of the actual and potential repercussions of this policy have been dominated by the interrelated issues of competition and privatisation (Graham 1995). It is argued here, however, that the patterns of demand within the EU's air transport network are shaped by economic and social forces external to the mode, which impact differentially upon - and often constrain - the effectiveness of aviation liberalisation measures. Although the precise causal relationship between infrastructural provision and economic development is less than clear, the EU and individual Member State governments have invested heavily in transport and other infrastructure as a stimulus to economic growth and to help attract inward investment to less advantaged regions. Perhaps the most obvious manifestation of this process is provided by the Trans-European Networks (TENs) being constructed to underpin the Single European Market (SEM). The Trans-European Transport Network (TETN), for example, is envisaged as a means of enhancing accessibility and integration, while harmonising national networks into a macro-network for the EU as a whole, not least by providing missing connections (often at border locations) and the attempted elimination of bottlenecks (CEC, 1994a). This initiative, which embraces rail, road, maritime and air transport modes, is also linked to other EU policies and objectives being articulated through the Regional Development and Structural Funds, which aim at socio-economic convergence and cohesion through the reduction of income inequalities and development disparities between central and peripheral regions and the promotion of an EU characterised by greater solidarity and social inclusion. Infrastructure has been a primary recipient of such investment, much of the expenditure being concentrated in the four poorest countries - Spain, Portugal, Ireland and Greece.

Simultaneously, however, all transport modes have been subjected - in varying degrees - to policies of liberalisation. (This term is preferred to deregulation, which in the EU - as elsewhere - is in fact a misnomer for re-regulation, the replacement of one set of interventionist rules by another more flexible set.) The liberalisation of the EU air transport market, completed in April 1997, is perhaps the most radical such initiative, largely because it has created a Single Aviation Market. In some contrast, the application of liberalisation measures to other public transport modes and providers within the EU - particularly rail - remains essentially defined at the scale of the Member State. The phased introduction of airline liberalisation was realised through three policy packages, progressively applicable from 1 January 1988, 1 November 1990 and 1 January 1993 : the latter - by far the most fundamental - was implemented over a four-year period (Table 1). The First and Second Packages were largely concerned with provisions that permitted the liberalisation of intra-European Community bilateral agreements, the inter-governmental accords that continue to control capacities and frequencies on many global air transport city-pairs. The Third Package, however, was very much more radical. In effect, its four-year transition period has transformed national - or nationally-defined - carriers into Community airlines. Effective 1 April 1997, all EU carriers have had open access to virtually all routes within the Union's 15 states (plus Norway and Iceland). This includes full cabotage - the right to operate eight-freedom domestic services, irrespective of the airline's home state. The only exceptions are some Public Service Obligation (PSO) routes, which remain protected from competition (although awarded through competitive tendering). Many of these serve otherwise remote island communities.

Additionally, the initial terms of the Third Package abolished the distinction between scheduled and charter carriers, permitting the latter to re-designate their flights as scheduled if they so wish. When this has occurred, however, frequencies are too low to appeal to the business market on which scheduled airlines depend. Consequently, although some blurring of the distinction has taken place, the Inclusive Tour (IT) leisure market (charter) remains largely distinct from the scheduled (business and leisure) segment.

Although the actual provision of air services - excepting only the PSO routes - is now left to market forces, airports generally remain as state-funded and operated infrastructure. Although there has been some outright privatisation, most notably in the United Kingdom (UK), which has pursued an ideologically-driven transfer of public assets to the private sector, other Member States have opted for more circumspect public-private arrangements that allow airports to be incorporated within integrated transport planning while encouraging private investment. Even then, however, the provision of publicly-funded air transport infrastructure may not necessarily be commensurate with the provision of enhanced air services, a reflection of restrictions on demand.

This brief summary of EU aviation policy also serves to demonstrate that no transport network can be understood or analysed apart from the historical processes, socio-economic forces and political decisions which created them. Thus, air transport provision in the EU cannot be 'ring-fenced' as an issue in itself but must be interpreted through its interactions and interfaces with other aspects of economy and society. Within this general context, the paper has three precise aims:

- to isolate the potential conflicts and tensions that arguably exist between EU aviation and economic development policies:
- to discuss the role of air transport in the wider context of the relationships between transport infrastructure provision and regional economic development:
- conversely, to assess the extent to which wider economic and social manifestations of regionalisation impact upon the spatial demand for air transport and its role in the TETN.

### **Aviation and economic development policies in the EU**

Although not necessarily the case, there is ample scope for tensions or conflicts between the essentially Keynesian ethos and objectives of planned TENs and cohesion policies, which seek a shared public-private articulation of economic development, and the neo-liberal advocacy of aviation deregulation. Such tensions are potentially exacerbated by the obvious differences that exist in the agendas being followed by DGXVI and DGVII - the European Commission (EC) directorates dealing respectively with regional policy and transport. The aviation policy is uni-modal in scope and has consistently allocated a higher priority to liberalisation than to cohesion, the major goal of regional policy. As argued here, the two objectives are not necessarily incompatible but there is little evidence that DGVII is prepared to interpret air transport policy within this wider remit.

Aviation policy depends on the efficacy of market forces in determining the spatial allocation - or supply - of air transport. Hence - PSO provisions apart - it consciously eschews any mechanisms to offset the potential disadvantages of neo-liberal economics readily apparent as incumbent airlines seek to protect their market positions, largely by adopting strategies that ultimately subvert competition. These include concentration at hub airports - effectively the establishment of spatial quasi-monopolies, alliances aimed at extending this control over market areas and perhaps even predation. The experience of the UK prior to the replacement of national aviation regulation by EC authority, suggests that the European airline industry can be made more competitive but, particularly because of imbalances of company size and restrictions on capacity at the largest airports, the realisation and maintenance of competition requires continuing regulation, albeit of a different form. In other words, the consumer benefits from a competitive regime may need protection if they are to be prolonged beyond the burst of often speculative market entry that inevitably follows the onset of liberalisation or deregulation. Nevertheless, the interventionist

role of the UK Civil Aviation Authority (CAA) was markedly down-graded by the advent of the Single Aviation Market, DGVII being content to regulate air transport through the enforcement legislation on competition, mergers and predation already existing in wider EU law. It is increasingly clear, however, that the time-period required to hear any formal complaints concerning predation, for example, effectively precludes any such protection being extended to many airline complainants (*Airline Business*, May 1997). Again, although hub dominance and alliances may be anti-competitive, the EC has attempted to intervene only once - in the case of the proposed British Airways/ American Airlines global alliance. Even then, that initiative did not emanate from DGVII (such external affairs being beyond its direct remit) but from DGIV, the competition directorate.

To question DGVII's reliance on open-market competition as virtually the only mechanism of liberalisation is not to deny the consumer benefits stemming from enhanced airline competition. The state-owned flag-carriers, for example, often offered only high-cost, low-frequency services to less advantaged locations, often combined with poor connections across capital city airports. It remains the case, however, that consumer benefits from competition - higher frequencies, cheaper fares, increased connections - are unevenly distributed, an issue which aviation policy fails to address because it has been conceived and executed in apparent modal and ideological isolation. Moreover, issues of regional development apart, tensions also exist between the unquestioned free market ethos of air transport policy and its belief in the mobility-enhancing effects of the market and other European objectives concerned with sustainable development and environmental protection. In a situation of already scarce airport infrastructure, public opposition to additional runways and mounting concern over aircraft noise and atmospheric emissions, aviation liberalisation increases flight movements by enhancing frequencies and connections but often at the expense of depressed load factors and smaller aircraft. Competition for high-yield passengers also encourages practices such as business-class cabins on short-haul flights which, in a wider context, are inherently wasteful because they depress capacity and load factors, while also leading to the use of larger aircraft to carry the passenger loads originally catered for in smaller cabins. The cumulative effect of aviation liberalisation may be to boost demand for scarce infrastructural and environmental resources to an extent greater than that actually required by aggregate increases in demand. This is not compatible with the wider notions of sustainability contained in Article 2 of the Maastricht Treaty.

If we return to the perspective on transport incorporated in regional development policies and the TETN, it is again apparent that EC strategies are characterised by differing ideological trajectories. Convergence and cohesion policies evoke a much more conscious public-private articulation in which market forces are shaped and constrained by spatial planning. It is assumed that accessibility disparities are one repercussion of the increasingly complex patterns of spatial polarisation of economic and social welfare that exists in capitalist countries. Therefore, regional planning aims at reducing such disparities - the so-called 'access gap', one mechanism being multi-modal transport complementarity operationalised through inter-modal interchanges. In this wider context, a single mode such as air transport can be visualised only as one element within a much wider mesh of processes through which transport impacts on economic development, its demand pattern largely established by that complex. In turn, this underlines the point that liberalisation and the establishment of a pro-competition regime may not be *the* key issue in EU air transport but merely one significant factor among a much larger array of processes.

### **Regional development, accessibility and EU transport networks**

Before addressing these issues, however, it is necessary to elaborate on the very ambiguous nature of the relationships between air transport and regionalisation in Europe. Unfortunately, this invokes a succession of rather nebulous and contested concepts - most notably mobility, accessibility and peripherality, all of which impact on the spatial patterning and volume of demand for air transport, which consequently is determined by a complex mesh of interrelated factors, operating at a variety of



different scales. The global demand for air transport is crudely determined by the dichotomy between the mobile (approximately 30 per cent of the world's population) and the immobile, denied access by poverty to air transport and many other manifestations of what the West chooses to define as global free markets. Demand for air transport is essentially fixed by Gross Domestic Product (GDP)/capita. Equally, mobility within the EU also varies spatially because of variations in wealth. Conventionally, these have been conceptualised in terms of centre-periphery relationships although - as argued here - this is too restricted a perspective to explain adequately the contemporary heterogeneity of EU regional disparities.

At an aggregate scale, DGXVI's document, *Europe 2000+* (CEC, 1994b), which discusses spatial planning in the EUR12 (prior to the accession of Austria, Sweden and Finland in 1995), divides the EU into a succession of transnational macro-regions, defined by geographical location and shared socio-economic characteristics (Figure 1: Table 2). Each of these macro-regions has differing requirements of air transport, reflecting the complex mesh of factors that - GDP/capita apart - impact on demand for the mode. These include location, population density, the extent of urbanisation and market segmentation, the cumulative effect being the creation of a finely differentiated mosaic of demand within the broad parameters of the macro-regions. For example, a fragmented low-density environment obviously provides a potential market for air transport but that will be translated into actual demand, only if the population - as in the Scandinavian countries - is sufficiently wealthy to purchase business and leisure mobility. Again, as less than 30 per cent of scheduled air travel is made for business reasons, there is a limited potential for low-density routes in less densely populated regions, precisely because these are likely to be the highest-cost air services. Many are entirely business oriented, depending on repeated flights by a fixed and often heavily restricted customer base. Thus demand may well be defined by no more than the distinctive business attributes of a particular locality.

Over 40 per cent of the EU's population live in the two most wealthy macro-regions, the Centre Capitals and Alpine Arc. All the principal airport hub systems - London, Paris, Frankfurt, Amsterdam - and the EU's 'capital', Brussels, are located in the former region. Together with Switzerland, the Alpine Arc, which is the most prosperous EU region, generates high density intra-regional air traffic and north-south connections to the Centre Capitals Region. To the west, conversely, the largely rural Continental Diagonal has only 5 per cent of the EU's current population. Its largest conurbations, most notably Madrid and Toulouse, are well integrated into international airline networks but a substantial number of medium-sized towns depend on connections provided by regional airlines, which may well be oriented only to national capital cities. Almost inevitably, Berlin is emerging as the air transport hub of the New Länder, the other cities, including Leipzig and Dresden, sustaining only weakly developed networks. The western Mediterranean - the so-called Latin Rim stretching from North Italy to Andalusia is increasingly well-connected by air, not least because of a succession of strong cities stretching from Venice through Milan, Turin, Nice, Marseille, Barcelona to Málaga. Conversely, air transport in the Central Mediterranean - the Mezzogiorno and Greece - does little more than connect peripheral cities and islands to Rome/Milan and Athens. The Atlantic Arc is a diverse macro-region with a large number of airports. Although its major cities, including Dublin, Nantes, Bordeaux and Lisbon, may be relatively well connected by air to the major European cities, the links between them are poor, reflecting the rather obvious conclusion that a shared geographical peripherality does not generate demand. The North Sea Region sustains a significant number of intra-regional air services, while its proximity to the Centre Capitals Region ensures that many regional airports have effective hub connections. Finally, the ultra-peripheral islands - the Canaries, Azores and Madeira - are heavily dependent on air transport while Scandinavia is also much more reliant on air transport than is the old Union.

This general pattern of regional variability in air transport demand is rendered very much more complex by the notion of accessibility, and the inevitable question it poses: 'accessibility to what, where and by whom?' According to Tolley and Turton

(1995, p. 14), 'the real meaning of mobility or the true goal of transport is access'. Vickerman (1995), who argues that the problem of peripherality is essentially one of accessibility, sees the term as linking two concepts at least - location and market potential (essentially population). In *Europe 2000+*, accessibility is measured in terms of cost and time rather than distance and it must also be recognised - as in the PSO provisions of the Third Package - that the access of isolated areas to wider networks is a basic social equity objective (CEC, 1994b). Other EC documents are framed in terms of accessibility of firms to factors of production and markets and of reducing the inaccessibility of disadvantaged peripheral regions to the core, particularly in terms of time (CEC, 1994c). There is also accessibility to: Brussels, the decision-making core of the EU; the national capitals of the individual Member States; and intercontinental air transport hubs. If an airline is essentially marketing mobility and accessibility, this diverse array of essentially point-to-point possibilities reflects a particular conceptualisation of market segmentation. Moreover, these broad categories of accessibility conceal a far more finely differentiated - even individually defined - mesh of requirements. Thus a scheduled airline has to patch together what may be very small increments of accessibility and attempt to aggregate them into - at bare minimum - a 19-seat commuter aircraft. At this scale, an airline is marketing accessibility to a sub-market essentially defined by a single individual.

More broadly, however, an airline is marketing not simply point-to-point manifestations of accessibility but also access to a modal and spatially diffused transport network. The TETN embraces notions both of inter-modal competition - although peripheral demand may be insufficient to justify expenditure on duplicated infrastructure - and multi-modal complementarity, the latter directed at improving access to an array of networks. Air transport constitutes one such modal element, partly overlapping with and partly complementing other networks, which is not necessarily the perspective of DGVII's modally-specific aviation liberalisation policy. Whatever the scale or mode, any network must contain elements of hub-and-spoke symmetry, the various modes interconnecting at hubs which are effectively multi-modal 'mainports' (Nijkamp, 1995). The balance of power in any network - which must combine point-to-point and transfer traffic - emanates from control of the modal hub, thereby allowing access to many peripheral places. Ironically, therefore, one effect of the TETN is to make peripheries more accessible from cores - to the advantage of the latter. Furthermore, while peripheries are benefiting from the TETN, so too are the already most privileged regions. For example, although roads are probably the most important means of enhancing accessibility measures for the four poorest EU states, the conurbations that will continue to derive maximum accessibility benefits from improvements in the trans-European road network are largely located in the Centre Capitals and Alpine Arc Regions (Gutiérrez and Urbano, 1996).

Turning to network characteristics, air transport most closely resembles High-Speed Trains (HSTs), not least because both modes require relatively large urban places to generate sufficient demand. They also share in creating new spatial patterns of accessibility on top of existing road and 'classic' rail networks. Neither offers continuous accessibility - indeed it is the pattern of restricted access to the respective networks that constitutes their shared diagnostic factor (Vickerman, 1994). Both HST and air transport networks also promote corridor effects, accentuating the linkages between the major urban centres which generate business flows. The EU HST network, strongly favoured in the TETN for inter-urban passenger transport (particularly on city-pairs of less than 500 kms), is most likely to enhance accessibility to mobility within - and to - the Centre Capitals - Alpine Arc axis, while offering some links to more peripheral places; it has relatively little to offer in terms of links between peripheries, even if the projected *TGV-Sud* linking Spain to Northern Italy is completed (Gutiérrez *et al.*, 1996).

Despite these similarities, however, air transport network characteristics are theoretically more complex and flexible compared to the HST system. Hub-bypass air routes - albeit restricted in number - are likely to be much more effective in terms of time than the classic rail services which feed the HST network. Again air transport

can service the hierarchy of cores that exist within the EU with greater equality of access than is true of the HST network which favours the Centre Capitals-Alpine Arc axis. Furthermore, national cores within the individual Member States are likely to capture the bulk of regional traffic, airlines can also provide rapid connections, for a greater number of places, to the competing intercontinental 'mainport' hubs located in the Centre Capitals Region.

A recognition that the question of accessibility cannot be reduced to a simple geographical dichotomy of core and periphery is not to deny the spatial polarisation of economic and social welfare that exists in capitalist states (Dunford, 1993). There is little prospect that such inequalities are amenable to market solution alone, a conclusion recognised explicitly in the regional policies adapted by the EU and its Member State governments. The improvement of transport infrastructure is a principal strategy of regional development policy, reflecting the assumption that relative inaccessibility and greater distance costs act as one determinant of relatively poor peripheral economic performances. In the EU, for example, 25 per cent of the population live in the largely peripheral Objective 1 regions in which GDP/capita is less than 75 per cent of the Community average. None the less, despite the capital expenditure on the TETN, there is no axiomatic cause-effect relationship between improvements in transport infrastructure and regional economic performance. The consensus is that infrastructure access is a necessary, although not sufficient, condition for regional growth and the attraction of Foreign Direct Investment (FDI). In a review of the evidence, Vickerman (1994) argues that returns on private investment at any given location are enhanced by the quality of the infrastructure which is thus a key determinant of a region's economic potential; economic and infrastructural development go hand-in-hand (CEC, 1994c).

This conclusion is supported by Chisholm's analysis of Britain and Ireland (1995), which concludes that their location on the edge of Europe is no intrinsic economic handicap. Geographically peripheral regions may be disadvantaged but it is deterministic to argue that this is necessarily so, a number - especially those possessing fairly well-developed socio-economic infrastructures - having attracted significant FDI. Chisholm claims that the scheduled air transport industry in the UK has reacted to what is effectively a spatial decentralisation of wealth by becoming more dispersed in terms of its operations. Although this latter process is partly attributable to shortages of airport capacity in the London region, it is also apparent that expansion of regional services and airports was one repercussion of the controlled liberalisation of the UK's domestic airline market, which occurred under the aegis of the CAA prior to the implementation of the Third Package (Graham, 1990; 1994). This regulatory regime encouraged and indeed protected smaller airlines developing services between provincial cities and also into the lesser London Area airports, most notably Stansted. Thus it appears that irrespective of location in terms of core and periphery, a region's dynamism is the result of the interaction of a whole raft of other features including: a big, well-equipped city with a strong image; highly educated population; indigenous small businesses; market access; suitable social climate; and a supportive and proactive regional authority. Territorial competitiveness also demands a good infrastructure because although this will 'not provide growth, ... the reverse is also true' (Cuadrado-Roura, 1994, p. 17); there is no possibility of economic growth without sufficient infrastructural systems. One caveat, however, to this more relaxed interpretation of location is that the existence of physical infrastructure networks does not necessarily off-set psychological perceptions of peripherality, the unarticulated reasons that might well be implicated in business location and investment decision-making.

### **Liberalisation, regionalisation and the demand for air transport**

#### *Liberalisation and market entry*

The preceding discussion has served to demonstrate that the factors impacting on the patterning and volume of demand within the EU's air transport network are more complex than might at first be thought. It is perhaps most convincing to view air transport as one enabling factor in regional development, overlapping with other

transport modes and their networks to enhance or diminish territorial competitiveness. The function of the TETN is largely to integrate and maximise the cumulative effects of these networks. Potentially the single greatest weakness in DGVII's policy on air transport results from the failure to place the liberalisation measures within this wider context, which determines demand and also constrains the possibilities for competition. The insistence that air transport be treated in a uni-modal fashion ignores the multi-modal complementarity of the EU's transport network and may well be one reason for what Caves (1994, p.30) refers to as the 'regulatory capture' of transport planning by the rail lobby. Thus the only major aviation investment within the TETN is the reconstruction of Milan Malpensa, which will replace Linate as Northern Italy's principal airport during 1998. The HST system is publicly funded and is thus regarded as unfair competition to an airline industry that relies on private investment, albeit while frequently using public-sector infrastructure. However, the more important equity issue may be that investment in HST systems are unlikely to contribute as much to cohesion as, for example, an enhanced road network or improvements in classic train networks within the disadvantaged regions.

Therefore, it can be argued that the emphasis on liberalisation of a single mode and the unchallenged, unqualified dependence on market forces alone has diminished the importance of air transport in the TETN which is - if nothing else - a major exercise in spatial planning. Arguably, this reflects another form of 'regulatory capture' in which DGVII has moved too close to the *laissez-faire* ethos of most of the major players and sectional interests in the air transport industry. Aviation policy is for airlines; HST strategies are located in a much broader socio-economic realm. The ideological determinism of aviation policy is compounded by evidence that liberalisation has only limited powers in altering patterns of demand, which are largely fixed by factors that have nothing directly to do with air transport. Competition will increase volume of demand - particularly if there are low-cost entrants - but largely within the pre-existing geographical parameters, thereby enhancing the congestion problems already characteristic of the air transport infrastructure in the most advantaged regions.

Given these important caveats, several studies have shown that consumers are realising advantages from enhanced airline competition, but only when an airport - (or perhaps) city-pairing is served by at least *three* carriers engaged in head-to-head competition (British Midland Airways, 1996; CAA, 1993; 1995). These benefits include lower and more flexible fares, improved frequencies, enhanced service levels and more extensive connection possibilities. The same analyses suggest that in the event of a route being served by only two carriers, these will operate as a duopoly. In 1996, however, of 520 airport-pairings within the EU, only 31 (6 per cent) were served by more than two airlines (although these did incorporate the densest routes). Almost two-thirds of airport-pairings (64 per cent) were operated as monopolies, although this total includes a large number of low-density routes unlikely to support competition (CEC, 1996). Nevertheless, as Table 3 indicates, the gradual implementation of the Third Package since 1993 has had very little aggregate impact on the extent of competition. Where this does occur, there have been tariff reductions, especially on economy-class tickets, but elsewhere, fares have risen to an extent adjudged sufficiently excessive for DGVII to threaten regulatory intervention. It is inevitable that consumer benefits related to fares are largely confined to the densest and most competitive airport- and city-pairs. The period since 1993 has also been characterised by a wave of market entry, mostly by small airlines or charter carriers converting their products into scheduled services. It is estimated that 80 new airlines began services between 1993-96 but DGVII has also identified 60 companies (not necessarily the same) which failed during the same period (CEC, 1996, ii-iii).

Entrants into the scheduled EU passenger air transport market can follow one of three strategies. First, by far the most difficult option is to compete head-to-head with incumbents on airport- or city-pairings, market entry being essentially conditional on a sufficient density of traffic to support competition although there is evidence that this will in turn help grow the market. Examples include many of the domestic and European routes operated by London Heathrow-based British Midland

(40 per cent owned by Scandinavian Airline System - SAS), the independent Norwegian carrier, Braathens SAFE, which competes with SAS on a number of city-pairs and AOM French Airlines, which challenges *Groupe Air France* on some domestic services.

Secondly, some carriers have followed the aggressive US-style low cost/'low-no frills' concept, originally pioneered by Southwest Airlines, and now adopted by a plethora of US market entrants. (The ValuJet analogy was hastily abandoned following the Florida DC-9 crash in 1996.) Carriers such as Dublin-based Ryanair, Virgin Express at Brussels and easyJet at Luton may compete with major airlines on inter-state city-pairings but often use lesser airports close to major cities. For example, Ryanair depends heavily on Stansted and Luton (for London), while also serving lightly-used airports such as Prestwick (for Glasgow), Bournemouth (for south-east England) and Charleroi (for Brussels). Such airlines, essentially low-fare, point-to-point operators, dependent on low costs and high capacity, may effectively be competing with more conventional transport modes - classic rail, ferry and long-distance coach - as much as incumbent airlines. Their expansion demonstrates that price can create markets, albeit largely located within the regions already most densely served by existing carriers. However, Ryanair - if it can sustain its present hectic expansion - has significantly enhanced Ireland's air transport linkages, especially with the UK. The carrier is also set to exploit the cabotage provisions of the liberalisation legislation by developing routes unrelated to Ireland.

Finally, by far most prolific mode of market entry under the liberalisation regime is to identify a market niche serving a particular airport and/or region. Some carriers have established credible operations by monopolising under-utilised airports. Examples include Maersk Air at Billund, the KLM subsidiary, Air UK, at London Stansted and Jersey European Airways at (confusingly) Belfast City. Again, low-density, short-haul regional traffic is an attractive market segment for air transport, particularly if it avoids HST competition (Caves, 1994). Many of these routes are too thin to support more than one carrier and they may also be high-cost, reflecting their dependence on a limited business market. The European Regions Airline Association (ERA) adopts functional criteria to define its member carriers, which essentially operate three types of route: a regional city-hub connection; a non-hub domestic city-pairing; a non-hub inter-state route. It is the latter two categories which can be described as hub-bypass routes. Regional airlines require spatially-defined niche markets, preferably sheltered from competition by geography and/or demand. They account for the majority of EU city-pair air services but their routes - largely aimed at high-yield business passengers - are generally monopolies, characterised by high fares, the higher costs of operating smaller aircraft (typically between 19-70 seats) and load factors averaging little more than 50 per cent. However, business markets benefit from the enhanced regional accessibility created by this particular manifestation of liberalisation, albeit at a cost. The more extensive provision of hub-bypass routes between regional cities, whether within a state or the EU as a whole, is constrained by a lack of demand and the intense competition facing regional airlines from terrestrial transport modes. Ireland, however, by virtue of being an island, is one exception, liberalisation having helped promote an increasingly dense mesh of routes serving regional cities in Britain.

#### *Regionalisation and the spatial patterning of demand*

In assessing the geographical pattern of demand, it should be remembered that air transport simultaneously caters for transfer and point-to-point traffic, both within the SEM but also - it must be strongly emphasised - the individual Member State transport networks. Although the TETN will integrate and harmonise these more effectively, national flows and networks still remain dominant, their configuration largely dictated by existing patterns of economic development, population and urbanisation. The essentially fixed nature of the pattern - if not the volume - of demand can be demonstrated by integrating data on airport passenger throughput into the macro-regions discussed above. As part of the TETN, the EC has attempted to delineate a trans-European airport network, forged from the array of disparate

national systems of the individual Member States (CEC, 1994d). Although essentially a statement of intent rather than a policy aimed at rationalising airport usage, this strategy defines a hierarchical triad of network components:

- 'Community connecting points' (> 5m passengers/annum) unite the EU network to the rest of the world;
- 'regional connecting points' (1m - 5m passengers/annum) link different regions of the EU and access the international services provided by the Community connecting points;
- 'Accessibility points' (250,000 - 1m passengers/annum) join more remote locations to the higher-order airports.

In terms of analysis, however, this scheme is rather too generalised to provide a sufficiently discriminating regionalisation of airports. The present analysis divides EU airports into a seven-fold classification, defined both by function and passenger throughput (Figure 2; Table 4).

The principal intercontinental hubs and airport systems are all located in the Centre Capitals macro-region, the continuous urban core that contains 25 per cent of the EU's population. The five airport systems (including Brussels which is more important as the centre of the EU than an intercontinental hub) generate a dense weave of domestic and feeder connections to other cities throughout the continent of Europe. No less than 45 per cent of passengers at Frankfurt are transferring flights, compared with 40 per cent at Amsterdam and 30 per cent at London Heathrow, which is the most important intercontinental hub. The London airport system (Heathrow, Gatwick, Stansted, Luton and City) handles the largest number of passengers and supports the highest number of connections, although Amsterdam Schiphol is the best connected single airport (Table 5). There is, however, surprisingly limited potential for inter-city air transport within this region because of road, HST and even classic train competition. Moreover, the hubs also create shadow effects that result in more distant cities enjoying superior access in terms of time than do closer locations. Of the 94 agglomerations of >300,000 population in the EUR12 (the pre-1995 Union), 45 do not have an airport handling in excess of 1.5 m passengers (1995 figures); no less than 25 of these are located within the Centre Capitals Region. However, all are included in the top 40 agglomerations for HST access (Gutiérrez *et al.*, 1996).

The airports serving free-standing metropolitan regions are variously located in the Continental Diagonal, Alpine Arc, North Sea Region, Scandinavia and the Mediterranean. They serve to extend and intensify the tight core of hubs into an essentially Y-shaped axis that stretches from Rome in the south to Manchester in the north-west and Helsinki in the north-east; Madrid is the solitary outlier to this pattern. These airports may act as the cores of networks serving domestic and EU destinations, few agglomerations of >300,000 population in this wider central axis not being served by their own airports. The metropolitan airports are also effectively interconnected with each other and to the Centre Capitals hubs. This reflects the corridors of business traffic within the most dynamic regions of the EU but also the substantial leisure and conference traffic generated by the largest cities, many of which are tourism attractions in their own right. Finally, all the airports in this category (Hamburg and Barcelona excepted) support some direct intercontinental services, Rome, Milan, Madrid Copenhagen and Zurich being particularly important in this regard.

The major regional airports handling between 3.0 and 6.5 million passengers per annum are located in much the same economic regions, serving to intensify the Y-shaped pattern while barely altering its geographical integrity; the inclusion of Glasgow and Edinburgh extends it northwards a little while Lyon, Marseille and Toulouse widen it slightly westwards. These airports are relatively well-connected, if less to each other than to the core hubs and metropolitan regions. They can support some hub-bypass routes and are likely to generate dense domestic city-pairs unless there is HST competition. However, it is very difficult for these airports to sustain any developed intercontinental services; the only exceptions largely stem from the fragmentation of trans-Atlantic services resulting from liberalisation of the various Member State bilaterals with the United States and the widespread use of long-haul

twin-jets. Otherwise, the accessibility advantages of the major regional airports more generally accrue from competitive, duplicated feeder connections to the intercontinental hubs. For example, in addition to Paris, Nice is currently connected - on an at least once daily basis - to no less than 14 other European cities offering some form of access to long-haul air services.

In total, these initial three categories of airport essentially define the primary patterning of demand within the EU. It is fixed by the distribution of cities, population density and wealth and is unlikely to change significantly. The remaining categories are either peripheral to this distribution or serve to intensify it further by occupying the interstices between the larger airports. The three airports serving the relatively isolated (from the rest of the EU) peripheral core cities - Athens, Dublin and Lisbon - act as centres for local feeder traffic generated by the peripheral peripheries and islands. They have very limited intercontinental linkages defined either by the geographies of empire (Lisbon) or emigration, but support reasonable - if often low-frequency - services to most of the major airports in the European core. Dublin, however, is particularly dependent on linkages across London, reflecting a demographic hinterland too limited to support more direct services. Although islands are hypothetically the most isolated locations (and may have only limited scheduled air services linking them to the national capital), a number of island airports - the two most important being Palma de Mallorca and Gran Canaria - support dense leisure-oriented services. In development terms, however, these are entirely focused on inbound tourism and have no other business function.

Although airports serving secondary regional cities continue to intensify the dominance of the north-south Y-axis, their locations are also more diverse, being scattered throughout the Mediterranean, Atlantic Arc, Continental Diagonal and New Länder. Traffic is largely domestic with some intra-EU - mostly hub-feed - routes; only rarely are these airports connected to each other. Finally, local airports are located everywhere although there is a preponderance of locations that are at some distance from national cores. As their services are largely domestic, they are very rarely linked to each other but - as with KLM/Air UK feeder services between several British local airports and Amsterdam - may occasionally access hubs outside their home states.

#### *The impact of liberalisation on the spatial pattern of demand*

Thus, despite the evidence of market entry, a curiously static picture is beginning to emerge, one that supports the hypothesis that the effectiveness of the more competitive regime imposed by liberalisation is itself constrained by other socio-economic processes. The preceding discussion implies that the most valuable linkages, especially for the smaller regional and local airports, are those to a hub because that maximises potential connections. Effectively, liberalisation has allowed the major carriers located in the Centre Capitals hubs and - to a lesser extent - at some of the metropolitan region airports to further consolidate and refine their formerly nationally-oriented networks into trans-European hub-feed systems. Increasingly, they use their own lower-cost subsidiaries, such as KLM CityHopper or Lufthansa CityLine, for these purposes, together with regional airline affiliates and franchisees (low[er]-cost carriers offering the branded service of the major airline). The operations of regional carriers are increasingly being integrated into the networks of the largest companies, it now being difficult to find an example of a fully independent regional airline of any substance. DGVII views such developments as evidence of another form of competition - that between overlapping networks across the entire EU and this may indeed prove to be one of the most profound outcomes of the implementation of the Single Aviation Market. This trend is being accentuated by the TETN, which designates the most important airports as high-speed inter-modal interchanges served by HSTs. Major non-capital cities such as Lyon, Nice and Barcelona - already well-connected - are thus increasingly more effectively linked - perhaps by several modes - to a succession of 'mainport' hubs; others, however, remain dependent on the primary link to the national capital for any connecting services. This is particularly true in southern Europe where weaker economies and



the continued hegemony of national carriers combine to limit the demand for air transport.

In order to assess further the interaction between this manifestation of competition and the patterning of demand, changes in hub connections during the implementation of the Third Package between 1993 and 1997 were recorded for a sample of airports drawn from the various categories and regions discussed above (Table 6). A clear pattern emerges from this data, one that confirms the essentially static spatial pattern of air transport demand. Surprisingly, perhaps, although it does confirm the feelings of many commentators that the completion of liberalisation in 1997 is unlikely to produce many further substantial service innovations, the majors having moved already to take advantage of the legislative changes, there were relatively few changes in the pattern of access to hubs outside the home state. The principal trend has been either a retention - or even increase - in the importance of the national capital, saving Lyon where the Paris route has been undermined by competition from *TGV Sud-Est*. Indeed, across the sample - Lyon excepted - almost all the increases in hub connections can be attributed to additional frequencies serving national capitals.

Clearly this trend directly reflects the competition which has followed domestic liberalisation in Spain, France and - to a lesser extent - Italy. In Spain, for example, the leisure carriers, Spanair and Air Europa, have entered the domestic market in competition with the Iberia group, while French domestic trunk routes, especially those between Paris, Marseille, Nice and Toulouse, are viciously contested by *Groupe Air France*, AOM and the (soon-to-be-merged) BA subsidiaries, Air Liberté and TAT European Airlines. However, the growth in domestic air traffic should not be attributed solely to competition but to the interaction of liberalisation with EU spatial planning strategies which - since 1989 - have seen substantial infrastructural investment (including regional airports), particularly in Objective 1 regions. In the Atlantic Arc, for example, cities are now much better connected to their national capitals than was formerly the case. This may represent an important gain in accessibility because the key problem for many disadvantaged regions lies in deficient internal transport systems, rather than inter-regional networks (CEC, 1994c). The increasing volume of air services linking major regional cities to their respective capitals, also reflects the enduring importance of national markets within the Single Aviation Market. Much of this traffic will be point-to-point, reflecting the continuing national orientation of business linkages, but it is also the case that language, familiarity, travel agency practices and costs may all combine to favour domestic hubs for connections.

As observed above, low-density, short-haul is another market opportunity that has been encouraged by liberalisation. Table 7 includes a comparison between 1993 and 1997 of the services offered by a sample of regional airports. Once again, in general terms, the relatively static pattern exhibited by the other data is repeated. The feeder systems to the Centre Capitals hubs are already in place and are unlikely to change much in terms of pattern - although the airlines might as the majors seek ways of lowering costs. Apart from Lyon, Barcelona and Nice, there were only minor increases in the number of routes although there is some evidence of additional frequencies. The most dramatic exception to this was at Clermont-Ferrand, developed as a hub by the French carrier, Régional Airlines, to connect Bordeaux, Nantes and several lesser western French cities to a variety of destinations including Basle, Geneva, Turin and Milan. Clermont-Ferrand apart, domestic connections remained static, an inertia that again points to the finite geographical limits on markets, irrespective of liberalisation.

Although Régional Airlines has underlined the possibilities for hub-and-spoke operations - not a strategy as yet widely emulated by other regional carriers - Table 7 suggests that, in general terms, the most promising regional markets are developing only where a number of strong cities are located within a specific geographic region at some distance from the Central Capitals Region. This geographical configuration is necessary to generate sufficient business traffic to support inter-state hub-bypass routes. The string of cities along the Latin Rim axis of the western Mediterranean



forms one such opportunity. As Figure 3 demonstrates, a sample of 9 airports shows a sustained increase from 30 non-stop weekday services from 30 in 1993 to 80 in 1997. The expansion has not been evenly spread, the principal beneficiaries, not surprisingly, being the three largest airports - Milan (Linate and Malpensa), Barcelona and Nice. Much of this growth in service can be attributed to the establishment of an east-west hub at Nice by the largest French regional carrier, Air Littoral (supplemented by a north-south domestic hub at Montpellier). This initiative provides a good example of the ways in which air transport can interact with regional development policies and wider spatial planning in the EU because the mode is clearly enhancing intra-regional accessibility, particularly in terms of time, albeit to a restricted business market. However, the demand generated by the evenly-spaced distribution of strong cities along the Latin Rim is a pattern not easily replicated elsewhere in the EU. For example, air services between the major cities of the Atlantic Arc display a much weaker pattern of growth (Table 8). Excepting the addition of low-frequency connections between Bordeaux, Bilbao, Porto and Lisbon, the route pattern has remained largely static and domestic (or quasi-domestic in the case of Republic of Ireland-UK services). The contrast between the Latin Rim and the Atlantic Arc points to one of air transport's principal limitations in supporting regional development. While point-to-point access to the national capital and some other major cities can be readily enhanced, the development of access to a network not focused on a national capital or Centre Capitals hub, requires a high threshold urban population.

### Conclusions

As the evidence of the Latin Rim demonstrates, liberalisation does help produce significant benefits for airlines - and by implication, regional development policies - because it allows them to grow operations and run them more efficiently, albeit often in collaboration with regional authorities or governments which, for example, are providing necessary infrastructural investment and incentives to start new routes. However, liberalisation in itself cannot ensure such outcomes because it is constrained by other factors - the geography of population, production, urbanisation and wealth - which are entirely external to air transport but create the spatial patterning of demand for the mode and restrain its potential volume. Consequently, as argued here, despite the evidence of growth in particular - especially regional and domestic - markets, there is a very considerable degree of inertia in the patterning of demand for air transport within the EU. The volume will increase but necessarily largely within existing geographical parameters.

Despite the ambiguities of the evidence and the difficulties in defining accessibility, transport infrastructure - including airline services - is clearly necessary for regional development. To reiterate, there is no possibility of economic growth without sufficient infrastructural systems. However, transport infrastructure requires heavy sunk costs and it is unlikely that these will be borne by the private sector. Thus, duplication of modes may be wasteful, which underscores the necessity of viewing transport, nor merely as a succession of independent modes and networks, but as an integrated complex of networks. Furthermore, the relationship between transport and economic development works the other way. The primary influence on the patterning of demand for air transport is not liberalisation but spatial disparities in economic development.

This implies that the preoccupation with liberalisation *per se* may not necessarily be to the wider or even long-term advantage of the EU air transport industry. It encourages the decidedly unhealthy mindset that regards air transport as a closed system and which produces projected growth figures that are not sustainable, given airport capacity restrictions. Even if these constraints were to be overcome - and there is no evidence of the political will to so do - one would have to question the financial, environmental and welfare costs of an unconstrained competitive air transport market. Inevitably, because air transport imposes its costs upon those who may not be directly using the mode, the European airline industry - together with other transport modes - will have to accept constraints on competition. It is doing this

on its own behalf anyway through the plethora of alliances, franchises and code-shares found throughout the EU. After all, to quote Sir Michael Bishop, 'Liberalisation means freedom to make money, not burn it' (*The Observer*, 11 May 1997).

These qualifications of the effects of liberalisation raise significant questions concerning the EU's air transport strategy. It must be recognised that this is markedly ideological in its commitment to the free market; cabotage, for example, is essentially a political rather than practical statement. The difficulty is that in a transport context of multi-modal complementarity and inter-modal competition within the overall parameters of the TETN, DGVII's air transport policy has failed in demonstrating any clearly articulated role for the mode. Furthermore, this ensures that it can be somewhat marginal - even the mode of last resort - within the wider spatial planning policy initiatives aimed at cohesion and convergence. Assuming sufficient demand, air transport does have a role to play in these strategies, most notably in connecting peripheral cities to Centre Capitals airport hubs and other business centres. However, it is doubly disadvantaged by the apparent duality of regulatory capture identified here - that of the TETN by the HST lobby and DGVII's Air Transport Policy Section's commitment to liberalisation at the expense of all else. At the precise historical moment when the pendulum to liberalisation and the free market seems to have swung as far as it is going, the EU air transport industry and its regulator have jointly distanced themselves from the policy initiatives most likely to influence the spatial patterning of wealth in the EU.

In essence, it is not surprising that the TETN allocates priority to roads and HSTs. Airline competition can clearly produce benefits for consumers and suppliers but the inter-linked concepts of an integrated regional planning and the TETN require continuity of provision of service. Apart from the PSO provisions and wider EU law - already shown as inadequate due to the extreme slowness in processing complaints - there is no mechanism within air transport policy to protect the maintenance of the benefits of competition. The free market is not necessarily the most appropriate mechanism to achieve this aim, given that the very function of unconstrained competition in a capitalist economy is the eradication of competitors and the establishment quasi-monopolies over supply and market areas. Thus it is not a question of deregulation but of re-regulation, the replacement of the unnecessarily anti-competitive, protectionist devices of the past by a more flexible form of regulation which recognises that - in terms of regional development - air transport has social equity as well as economic dimensions. It is ironic too that the primary factor impacting on demand and market opportunities in EU air transport - the public transport mode most oriented towards free-market ideas - is the success of interventionist spatial planning aimed at inducing socio-economic convergence within the Union.

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Table 1. The three EC air transport liberalisation packages.

1	Implemented from 1.1.88	Allowed multiple designation, fifth-freedom rights, automatic approval of discount fares; double disapproval rule applied to full fares in Second Package.
2	Implemented from 1.11.90	
3	Implemented from 1.1.93 - final implementation 1.4.97	
	Permits	
	<ul style="list-style-type: none"> <li>• free pricing on all fares</li> <li>• full access to all routes including cabotage</li> <li>• abandonment of distinction between charter and scheduled carriers</li> <li>• Protection for routes designated as public service obligations</li> <li>• EC retention of right to intervene against excessive fares, predatory pricing and seat dumping</li> </ul>	

Source: Graham, 1995.

Table 2. EUR12 Macro-Regions.

Region	Land Area	%age EUR12 population 1991	GDP/capita (1991 in PPS, EUR12= 100)
Centre Capitals	11.2	25.9	116
Alpine Arc	12.6	15.9	122
Continental Diagonal	18.8	6.0	87
New Länder	4.7	4.6	33
Latin Rim	12.9	11.0	91
Cent. Mediterranean	9.8	8.4	62
Atlantic Arc	21.1	13.5	80
North Sea	8.4	13.4	99

Source: CEC, 1994b.

Table 3. Effects of the Third Package on competition; Community routes (airport to airport)

Routes	Jan. 1992		Jan. 1993		Jan. 1994		Jan. 1995		Jan. 1996	
	No.	%	No.	%	No.	%	No.	%	No.	%
Total	510	-	488	-	482	-	522	-	518	-
Monopoly	283	56	296	61	318	66	342	66	329	64
2 carriers	208	40	182	37	150	31	154	29	158	30
> 2 carriers	19	4	10	2	14	3	26	5	31	6

Source: CEC, 1996.

Table 4. Classification of EUR15 airports (plus Switzerland and Norway) by regional function.

Category	Passenger throughput (1995) (million pax)	Number
Intercontinental hubs	12.0 - 83.0	6
Airports serving free-standing metropolitan regions	7.0 - 22.0	15
Major regional airports	3.0 - 6.5	13
Airports serving peripheral core cities	6.0 - 10.5	3
Airports serving leisure destinations	1.0 - 15.0	13
Secondary regional airports	1.0 - 3.0	36
Local airports	Less than 1.0	90

Source: Airports reporting to ACI, Geneva, 1997.

Table 5. Intercontinental hubs (daily non-stop connections).

Airport system	Passengers 1995 (million)	EU destinations (plus Switzerland and Norway), Jan. 1997	Domestic destinations Jan. 1997
London <sup>1</sup>	83.3	74	14
Paris <sup>2</sup>	55.1	55	45
Frankfurt	38.2	46	15
Amsterdam	25.4	68	4
Brussels	12.6	56	-

1 Heathrow, Gatwick, Stansted, Luton and City

2 Charles de Gaulle (Roissy) and Orly

Source: OAG Flight Planner.

Table 6. Connections to hubs, 1993-7.

City	1993		1995		1997		Inc 1993-7
	Total	%age home hub	Total	%age home hub	Total	%age home hub	
Lyon	30	33	32	78	40	30	33
Toulouse	28	68	32	75	64	78	129
Leipzig	10	40	9	66	8	75	(-20)
Barcelona	66	48	78	56	108	56	64
Nice	51	55	55	56	61	59	20
Thessaloniki	3		2		2		
Naples	7	29	9	44	12	58	71
Catania	8	100	9	100	9	100	12
Belfast	19	89	27	96	26	96	37
Sevilla	10	80	8	88	5	100	(-50)
Newcastle	18	78	20	70	21	67	17

Source: OAG Flight Planner.

Table 7. Regional services, 1993-7

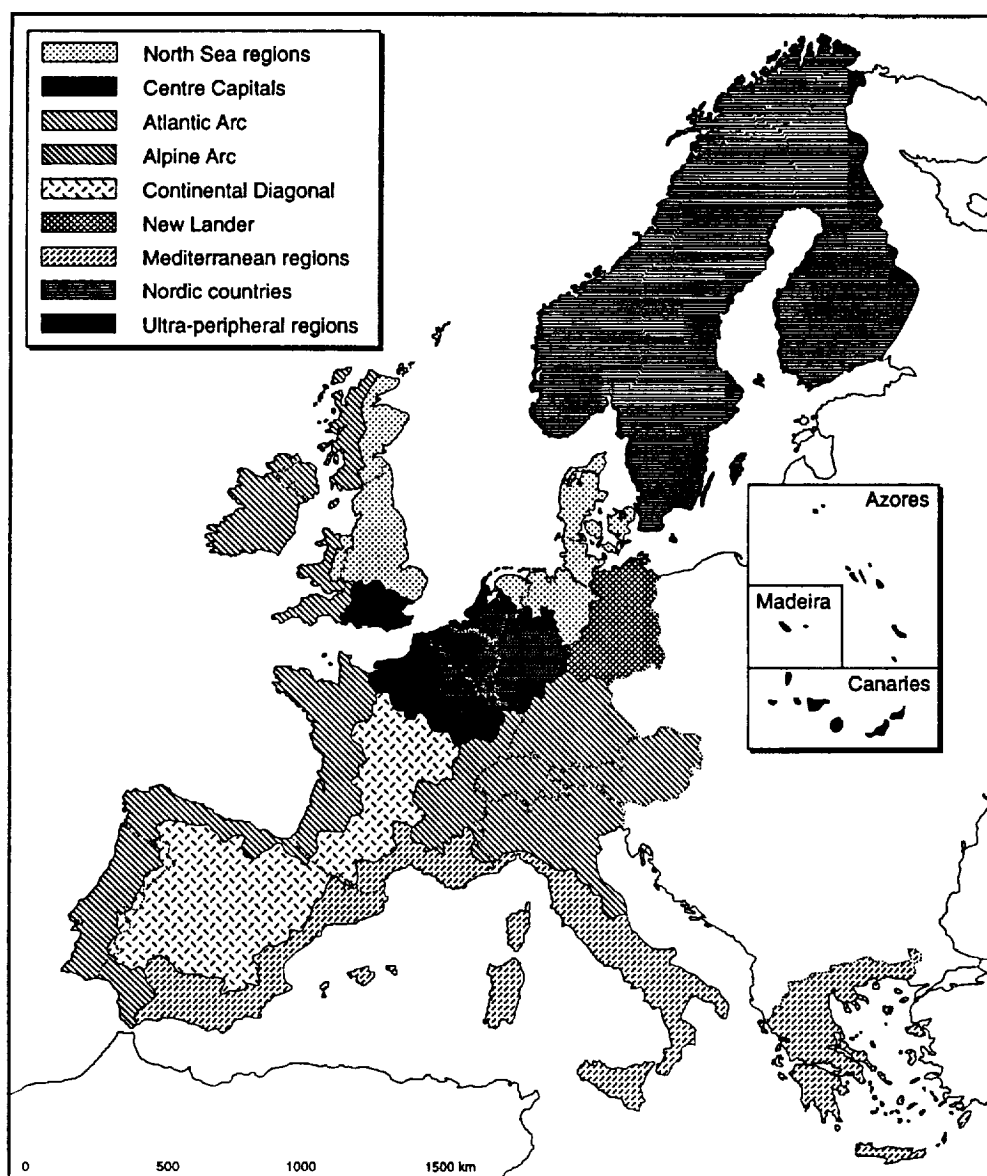
City	EU Connections (plus Switzerland, Norway)		Domestic Connections	
	1993	1997	1993	1997
Lille	1	0	11	12
Rotterdam	3	7	-	1
Lyon	11	15	24	23
Toulouse	7	9	11	12
Leipzig-Halle	5	2	15	13
Barcelona	26	31	23	25
Nice	15	20	16	20
Thessaloniki	6	6	1	1
Naples	4	5	10	10
Catania	0	0	8	10
Belfast	2	1	16	17
Santiago de Compostela	0	2	3	6
Zaragoza	0	0	1	2
Billund	7	12	1	1
Newcastle	5	8	6	9
Venice	12	12	6	6
Verona	3	4	4	4
Clermont- Ferrand	2	4	6	14

Source: OAG Flight Planner.

Table 8. Atlantic Arc airports, 1993-97.

	Glasgow		Dublin		Cardiff		Nantes		Bordeaux		Bilbao		Porto		Lisbon		Atlantic Arc	
Glasgow	-	-	3	6	3	3	-	-	-	-	-	-	-	-	-	-	6	9
Dublin	3	6	-	-	1	1	-	-	-	-	-	-	-	-	-	-	4	7
Cardiff	3	3	1	1	-	-	-	-	-	-	-	-	-	-	-	-	4	4
Nantes	-	-	-	-	-	-	-	-	2	3	-	-	-	-	-	-	2	3
Bordeaux	-	-	-	-	-	-	2	3	-	-	-	1	-	-	-	1	2	5
Bilbao	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	2	0	4
Porto	-	-	-	-	-	-	-	-	-	-	1	-	-	-	13	15	3	16
Lisbon	-	-	-	-	-	-	-	-	-	1	1	2	13	15	-	-	13	18
Total	6	9	4	7	4	4	2	3	2	5	0	4	13	16	13	18	44	66

Source: OAG Flight Planner.



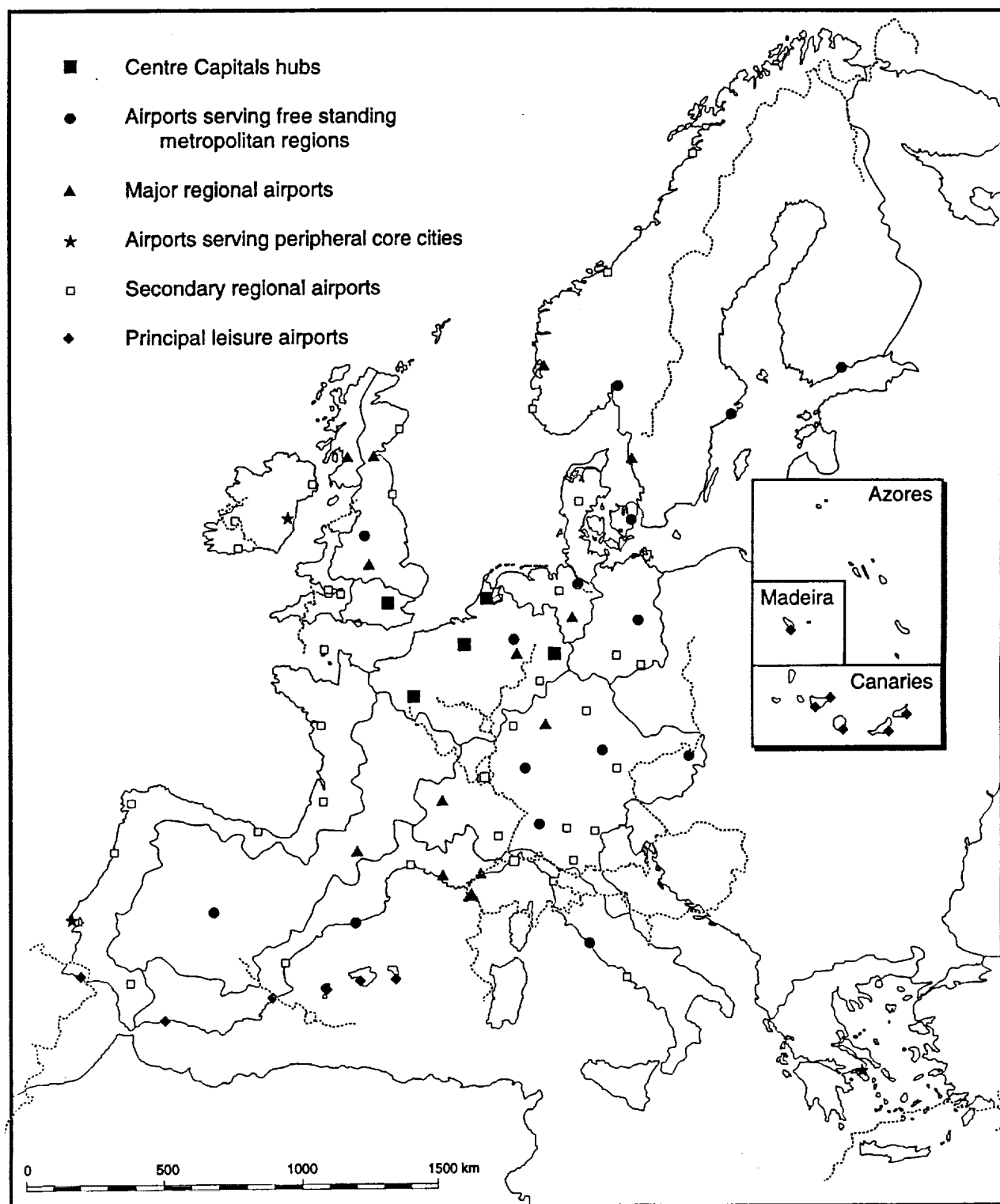


Figure 2. EU airports classification.



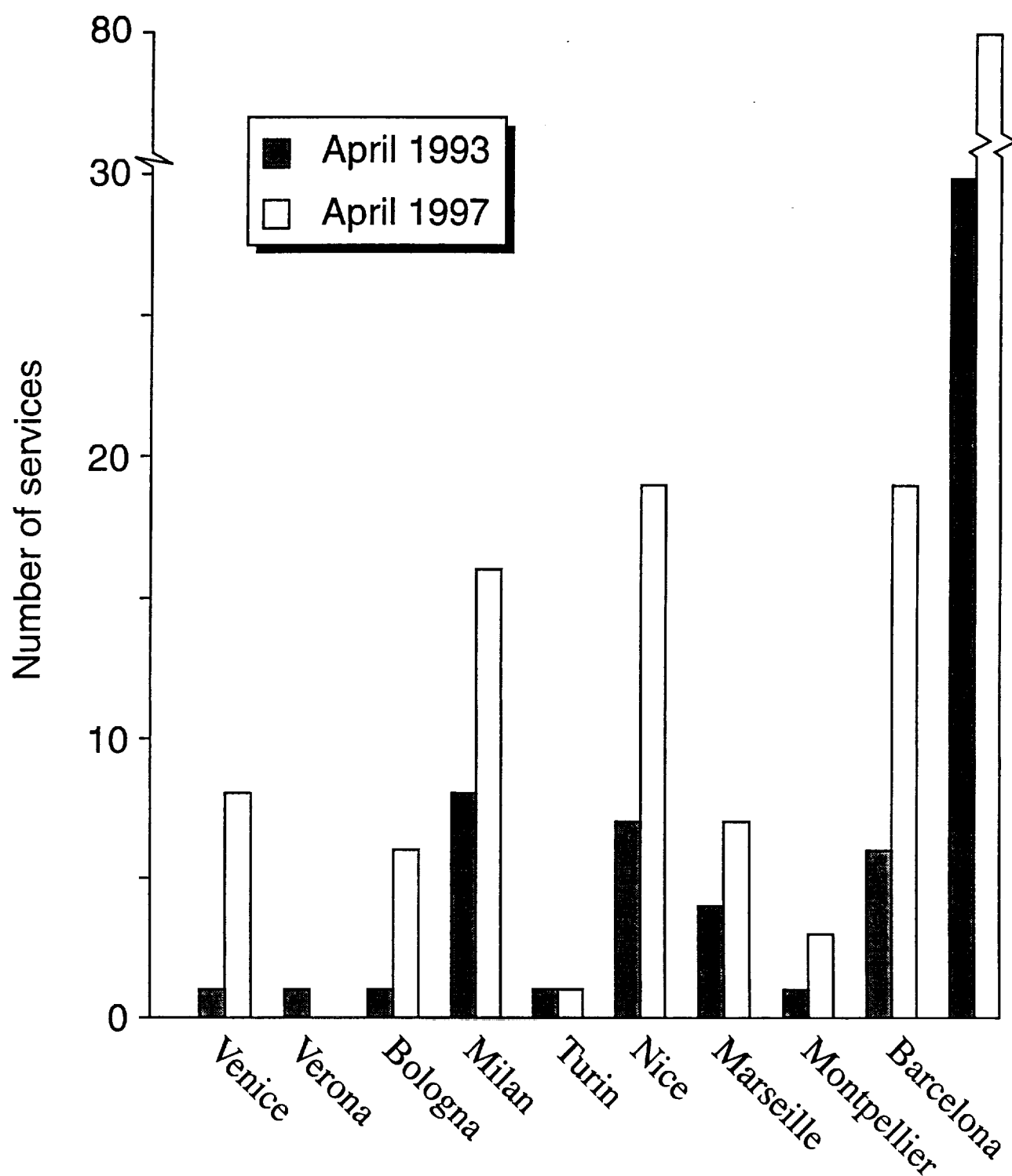


Figure 3. Latin Rim airports, Weekday non-stop services, 1993-97  
(Source: OAG Flight Planner).

**SURVIVING THE SINGLE MARKET:  
CORPORATE DILEMMAS AND STRATEGIES OF EUROPEAN AIRLINES**

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CORPORATE DILEMMAS AND STRATEGIES OF EUROPEAN AIRLINES

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Introduction:

In April 1997, the liberalization of air transport within the European Union enters its final phase, in which carriers will be free to operate between all airports within the Union, and particularly on routes within Member-States. This change is potentially as radical in its implications as airline deregulation was in the US, although it mainly entails the opening of new markets to all airlines, rather than the removal of general regulatory controls on routes and pricing as was the case in the US.

This paper examines, using the air transport case, the complicated interaction between deregulation (in fact, variable and asymmetrical deregulation across several markets), economic integration (represented by the establishment of the Single Market), and corporate strategy (expressed in the responses of European carriers to the challenges facing many service industries).

A major difficulty in writing such a paper is that it involves connecting debates that are usually conducted in isolation from each other.

Deregulation is usually discussed in relation to its domestic implications, rather than to its implications for international trade. Although discussion of deregulation sometimes involves looking at the responses of an industry, such discussion typically does not lead to a more detailed examination of particular firms, and therefore does not deal with the problem of why firms react differently to regulatory changes. Moreover, argument about deregulation usually stops at the shoreline: it does not concern itself much with the consequences of deregulation for international trade. This is frustrating in the case of the airline industry (and many others) because they have stakes in several markets, and changes in the regulatory regime in one market may create opportunities or problems for their operations in others.

Arguments about economic integration commonly involve (at least in the case of the EU) much commentary on the meaning and implications of legal texts and cases. Otherwise, they typically

involve assertions of a macroeconomic sort concerning the broader gains in efficiency (and consumer choice) arising from the establishment of an enlarged, single market. Again, scholars (and, indeed, many policy-makers) do not seem to be very interested in how public policy affects the behavior of firms - specifically, how economic integration (accompanied by deregulation and sometimes privatization) changes the parameters of corporate strategizing, alters the competitive balance between firms, and reshapes their views about the development and marketing of goods and services. Again, this broad approach leads to neglect of the interesting issue of differences in the responses of individual firms facing a similar set of threats and opportunities.

Such lack of interest is strange in view of the liberal ideology informing the hopes for and justification of economic integration. A policy intended to liberate the market might be expected to stimulate an interest in how business is responding, since the success of the policy is in the hands of firms and their customers. Psychologically speaking, it is as if there is an unconscious residue of "public sector" thinking in EU policy-making: Brussels has legislated a free market and so the only remaining issue is to ensure that private businesses "implement" the free market properly. It is as if firms are surrogate public agencies.

Writing about corporate strategy and competitiveness does seem to recognize the likely impact of deregulation (including differential deregulation). However, there is a disciplinary and professional gap between the constituencies of writers on public policy and those of writers on business strategy that leads to the latter mainly addressing themselves to the "internal" issues of corporate strategy - internal to particular industries and firms. There is less of a constituency (or perhaps there is an underserved constituency) for more analytic writing on how the processes of deregulation and economic integration affect each other and interact with specific processes of corporate strategy-making and implementation.

In trying to make a connection between deregulation, economic integration and corporate strategy, the basic questions seem to be:

- at a "macro" level:

(a) How does economic integration affect corporate strategy and the constraints and incentives facing particular industries?

(b) How does deregulation (or "liberalization") affect the shaping of corporate strategy, the role, powers and problems of government, and relations between government and business?

(c) How do corporate strategy and its consequences feed back into public arguments about the wisdom and future course of

integration and deregulation?

- at a sectoral level:

(d) How is the establishment of a single market affecting the parameters of corporate strategy and the pursuit of competitive advantage in the European air transport industry?

(e) How does the liberalization of operations and marketing provided for by the Third Package affect the parameters of corporate strategy for European airlines?

(f) What kinds of public policy issues are likely to arise as the industry responds to integration and liberalization?

- at a firm-specific level:

(g) How are particular firms (and types of firm) in the industry affected by the establishment of a single market? To what extent and in what ways does the latter create opportunities for some firms and obstacles for others?

(h) How does liberalization affect the "life chances" of particular firms (and types of firms) differentially? How does it increase the opportunities for some firms, while intensifying and multiplying the problems facing others?

One paper cannot deal with all of these questions. This paper deals mainly with the question of how the establishment of the Single Market and liberalization of air transport markets are affecting the parameters of corporate strategizing and, especially, how they are causing a differentiation between firms. Some firms are expanding their ambitions, while others are retrenching and withdrawing. But all are being forced to consider how they will survive and where they will fit in an integrated and liberalized market.

Air transport as a regulated service industry:

The absurdity of divorcing discussion of public policy from discussion of corporate strategy is especially clear in the case of air transport. It is an industry that has been highly regulated (both domestically and internationally) since policy-makers first conceived the notion of "air space" and contemplated its possible uses. It is also (therefore) an industry in which influencing, accommodating to, bypassing, and abolishing regulatory regimes play a significant part in corporate strategy. Therefore defining the nature of the sector also involves describing the nature and impact of regulation.

Air transport is a service industry because when you buy a seat from an airline, you cannot (or shouldn't) remove the seat

when leaving the plane. The industry is not one of those service industries that can export its services abroad: it is one that requires a high degree of interaction between customer and service provider (you have to go to the plane to use the seat).<sup>1</sup> To the extent that it "exports" and trades, it must do so by providing the service abroad - through actual establishment in each foreign market. Cross-border transactions occur in the form of aircraft crossing frontiers and (financially) in the form of investments required to sustain the offering of services abroad and remittance of revenue generated by the sale of services abroad. To the extent that "trade" occurs, it takes the form of foreign exchange transactions rather than that of the dispatch of a commodity.

Thus, liberalization of this kind of service trade hinges not on the process of trading itself, but rather (as Dicken points out) on "the conditions under which providers of services are permitted to establish an actual direct or indirect presence in a specific national market." Liberalization "is really about foreign direct investment and the other modes of international involvement which firms may use."<sup>2</sup> The choice (and control) of location is crucial for competition, as is the degree of freedom allowed for mobility between locations.

International air transport has been closely regulated since its creation, with tight restrictions applied by states to the choice of locations (which airlines may offer international service from their airports) and to mobility (to and from what points abroad airlines may offer service). Multinational enterprises (MNEs) have been very slow to develop in this sector because of legal restrictions on foreign equity ownership in national carriers and because of restrictions on the operation of foreign carriers on domestic routes (cabotage).

Thus KLM Royal Dutch Airlines, for example, cannot currently own more than 25% of the voting stock of its US partner (Northwest). Moreover, even under the US-Netherlands "open skies" agreement, though KLM can fly from any Dutch city to any city in the US, it may not pick up passengers in, say, Detroit and fly them

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<sup>1</sup> For a classification of services according to the degree of goods content and the level of customer contact, see S.Vandermerwe and M.Chadwick, "The internationalization of services," The Service Industries Journal, 9, 1989, 79-93.

<sup>2</sup> Peter Dicken, Global Shift. The Internationalization of Economic Activity (London: Paul Chapman, 1992), 355. See also M.Gibbs, "Continuing the international debate on services," Journal of World Trade Law, 19, 1985, 199-218.

to Memphis.<sup>3</sup> Moreover, it cannot even pick up passengers in Detroit and carry them to a foreign country other than the Netherlands without an explicit "fifth freedom" agreement between the US government, the Dutch government and the government of the relevant third country. And this under an "open skies" agreement denounced as excessively liberal by some US labor unions and airlines!

International air transport is thus both "location-constrained" and "nationality-constrained."<sup>4</sup> It is "location-constrained" by the nature of the service it provides (requiring sustained interaction between providers and consumers of the service). Indeed, the choice of locations is even more restricted than in comparable industries because of air transport's technical dependence on a limited number of high-cost facilities shared with other firms (airports). While, as in other industries, "clustering" is strategically advantageous (allowing passengers to switch between carriers and providing some sharing of costs), it is also largely imposed by the costs of airport development and the technical requirements of operation.<sup>5</sup>

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<sup>3</sup> It may, however, fly passengers originating outside the US on to Memphis as part of a continuing international service.

<sup>4</sup> One categorization of services distinguishes between:-

(a) those which have a product distinguishable from the process producing it and which can therefore be exported;

(b) those which are "location-bound" due to the impossibility of separating consumption from the process of production (haircutting being an example) and which therefore require a presence abroad for purposes of "export"; and

(c) those "mixed services" in which some locational substitution is possible.

(J.J.Boddewyn, Marsha B.Halbrich and A.C. Perry, "Service multinational: conceptualization, measurement and theory," Journal of International Business Studies, 17, 3 (Fall 1986), 41-58). Clearly air transport falls into the second category.

<sup>5</sup> A parallel would be if all banks were required by a city or state to offer services in a designated area, resulting in intense competition for office space and parking. A problem of air transport is therefore that, whether or not the provision of the service itself is a case of "natural monopoly", the provision of its infrastructure almost certainly is such a case.

It is intriguing (if currently fruitless) to speculate about how competition and corporate strategies in this sector would

International air transport is also (at present) "nationality-constrained" in respect of operation abroad, through the tying of traffic rights to the nationality of airlines and through restrictions on operation on domestic routes in foreign countries. Even the offering of international service remains dependent on the provisions of bilateral agreements between the countries concerned. For foreign carriers, access to concentrations of traffic in domestic markets abroad depends on alliances with airlines permitted to operate in those markets.

#### Economic integration and liberalization in the EU:

European airlines face serious challenges (and have some interesting new opportunities) as a result of the creation of a single market within the EU. But they also have to cope with a changing regulatory environment on routes between the EU and other states and with the effects of deregulation within other major domestic markets (notably within the US).

Liberalization within the EU differs from the deregulatory process in the US in that it envisages the creation of multiple opportunities within what were previously domestic markets. In the US case, the object of deregulation was to expand access by a broad range of carriers (including new carriers) to an existing national market. The European process is (in American terms) more analogous to a situation in which intra-state carriers with varying stakes in inter-state commerce (and, indeed, in foreign trade) find themselves presented with the right to operate in all other intra-state markets, and to operate at will in all inter-state markets and eventually to operate abroad from any city in any state.<sup>6</sup>

European liberalization thus involves the simultaneous integration of many markets, whereas American deregulation focussed on increasing the operational flexibility (and number) of carriers

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change if the aerospace industry developed a high-capacity, vertical-take-off-and-landing airliner. Such a machine would still face serious environmental problems and would require ground-handling facilities, but basic maintenance could be conducted at other sites. Perhaps airships still have a future.

<sup>6</sup> The qualification "eventually" is used because, while the EU's Third Package gives all EU "Community carriers" the right of establishment (connoting the right to offer service) in any Member-State, the existence of bilateral agreements between Member-States and third countries (e.g., Canada) effectively limits the right to take off from a European airport and to land at the desired foreign destination. Once (or if) the EU itself supplants Member-State governments as the European signatory of bilateral or multilateral agreements, this apparent conflict of laws should disappear.



within a market that was already a single market. The values and expectations of the two processes are essentially the same, but the barriers differ. The American process had to overcome restrictions on entry created by a prior, national regulatory regime: the European process has to overcome barriers presented by the existence of multiple national jurisdictions and their attendant regulatory regimes.

#### Corporate strategy and the pursuit of competitive advantage:

European airlines thus now face:

(1) a fluid regulatory environment, with different rules applying in different markets (their national but now open markets, the EU market, and external markets);

(2) invasion of their national markets by other EU carriers;

(3) more intense competition in intra-EU markets; and

(4) a wider range of competitors in their long-distance markets, notably American carriers with lower costs and higher productivity due to the battles of deregulation in the US.

What are the sources of competitive advantage for service firms in such a situation? What special obstacles and advantages face airlines in general (and European airlines in particular) in adopting strategies to secure competitive advantage?

Three factors seem to be fundamental in shaping the choices now facing European airlines and in shaping the strategies they adopt, while a fourth is of diminishing (but not yet negligible) importance.

One factor is established market stakes - the mixture of services in domestic, intra-European, and long-haul markets that airlines have developed, sometimes over many decades and often as a result of government decisions on the division of traffic or strategic and imperial commitments. Market share and market size are likely to determine how important this factor is and whether a carrier tries to change the mixture. The second and third factors (commonly adduced in writing about service industries) are location-specific advantage (LSA) and firm-specific advantage (FSA)<sup>7</sup> These factors may modify the relative value of market stakes and the ability of airlines to survive or maintain market

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<sup>7</sup> John Dunning, International Production and the Multinational Enterprise (London: Allen and Unwin, 1981), cited in Peter Enderwick, "Some Economics of Service-Sector Multinational Enterprises" in Enderwick, ed., Multinational Service Firms (London: Routledge, 1989), 17.

share in the face of competition.

The fourth factor (which, though not discussed in detail below, may affect the incidence of the other three) is state aid in its various, and variably transparent, forms. While the EU Commission is officially dedicated to creating "a level playing field" by controlling and eventually eliminating subsidies, the flesh has been notably stronger than the spirit in practising this kind of virtue. Despite an accelerating trend toward privatisation, a number of national carriers are still effectively state-owned and can get government support when they make the Augustinian plea that they want to be free of subsidies but not yet. The governments concerned say that, for their part, they favor full market competition, but not until their carriers have had a chance to prepare themselves for competition. Moreover, direct subsidies, while particularly effective in outraging rival airlines, are of diminishing importance and easily targeted, compared with subtler non-tariff barriers, exemplified by differential access to and pricing for ground services and runway slots.

The following sections examine the first three factors. The last part of the paper explores ways in which economic integration and liberalisation are likely to affect the impact of these factors on corporate strategy, leading to a typology of carriers and strategies.

(a) Market stakes: European airlines have historically had larger stakes in long-haul routes than their American counterparts.<sup>8</sup> Although the great majority of the 156 European airlines offering scheduled services in 1996 were exclusively involved in operating on domestic and intra-European routes, the major carriers have (in varying degrees) considerable exposure on international routes. They do, however, differ significantly in the proportions of their revenues derived from the three kinds of service (see Table 1). At one extreme are carriers like SAS and Iberia that derive less than 30% of their revenue from services outside Europe (and in fact carry over 45% of all their passengers on domestic services). At the other are carriers like KLM and British Airways (BA) that get over 55% of their revenues from long-distance routes (KLM in fact has no domestic routes).<sup>9</sup>

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<sup>8</sup> In 1990, long-range flights accounted for over 68% of the Revenue Passenger Kilometers flown by EU airlines, compared with 34.3% for US carriers (Commission of the European Communities, Air Transport Relations with Third Countries. Communication from the Commission to the Council, COM(92) 434 final, Brussels, 21 October 1992, 12, and Table E, 55).

<sup>9</sup> Sabena in Belgium and Luxair in Luxembourg similarly lack domestic routes.

The weight of the market stake factor (in any rationally-conceived strategy) presumably depends on both market share and market size. EU airlines in fact differ significantly in the degree of competition they face in each kind of market.<sup>10</sup>

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**TABLE 1: DERIVATION OF REVENUES (%) (1992):**

<u>Services:</u>	EUROPEAN	EXTRA-EUROPEAN	(ATLANTIC)
<u>Carrier:</u>			
KLM	28.9	65.3	(33.9)
BRITISH AIRWAYS	42.2	57.8	(30.7)
SWISSAIR	47.6	52.4	(24.9)
AIR FRANCE	50.1	49.9	(16.7)
EU AVERAGE:	50.7	49.3	(18.4)
LUFTHANSA	52.8	47.5	(20.6)
ALITALIA	55.6	44.4	(16.6)
IBERIA	70.1	29.9	(25.6)
SAS	80.9	19.1	(10.2)

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Source: Lehmann Brothers, European Airlines: A Turbulent Decade, 14 September 1993.  
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An airline might have a considerable investment in the long-haul market (relative to its involvement in other markets), yet not be a major player in that market or in particular segments of it

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<sup>10</sup> For example, while the larger national markets are increasingly contested, in six EU Member-States the dominant national carrier accounted in 1996 for over three-quarters of all available seats (see Appendix 1 for figures on dominance of domestic and intra-Community routes by flag carriers). In four states (Austria, the Netherlands, Ireland, and Greece) the national carrier still enjoys a monopoly of domestic services, though (as in the Dutch case) the market concerned may be very small (Commission of the European Communities, Impact of the Third Package of Air Transport Liberalization Measures, Communication from the Commission to the Council and the European Parliament, COM(96)514 final, 22 Oct 1996, 10).

(such as the North Atlantic).<sup>11</sup> It might, alternatively, have a major share in a market that is quite small (such as the Irish domestic market).

Both situations would raise questions about the advisability of keeping the current distribution of market stakes. To be a small player in a larger market obviously invites elimination, while being a major player in a small market is likely to restrict growth, absent opportunities to penetrate other markets. Survival in one situation and persistence in the other are sometimes due to particular advantages conferred by one of the other factors examined here - location-specific or firm-specific advantage - or by regulatory protection.<sup>12</sup>

Variation in market stake also entails variable exposure to different regulatory regimes. The strategizing of airlines such as KLM and BA (and, where the North Atlantic is concerned, Lufthansa and Swissair) has to be sensitive to the provisions of bilaterals and to limits on access to major non-EU markets, especially the US market. More than their more European-oriented competitors, such carriers need alliances with US carriers which can provide the passenger "feed" that, because of restrictions on foreign ownership and cabotage, they cannot generate by setting up their own subsidiaries in the US (or, indeed, almost anywhere else outside the EU).

The price for obtaining official US support for such alliances is, however, acceptance of an "open skies" bilateral, which implies more intense competition from US carriers. The enthusiasm of EU governments and airlines for such agreements has varied inversely with the size of their domestic markets and their airports' shares of transatlantic traffic. The Netherlands was very willing in 1992 to accept an open skies agreement since (as American critics angrily pointed out) it offered Dutch airlines the right to fly to any city in the US, while offering access to only one international

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<sup>11</sup> A well-known (though rather distinct) example is Icelandair's role in the North Atlantic market. Though air transport is quite important within Iceland, the country's population is only 300,000 and does not therefore provide the basis for a large domestic system. Icelandair's European network is designed specifically to collect and distribute traffic from the carrier's North American routes, on which it has a monopoly. But Icelandair is in competition with other North Atlantic carriers and carries a very small proportion of all traffic. This case exemplifies the perennial problems of determining what is the relevant market for purposes of assessing competition.

<sup>12</sup> Such as cabotage in domestic markets or a rule requiring nationals or public servants of a country to use its international carrier.

airport in a country with a population of only 15 million.<sup>13</sup> Once the alliance between Northwest and KLM took effect, KLM also had the opportunity to collect traffic from cities it did not directly serve through Northwest's hubs.

Germany, France and the UK, all with populations of well over 50 million and the highest shares of transatlantic traffic, have been much more resistant than the smaller European states to the open skies formula.<sup>14</sup> On the one hand, they are tempted by the prospect of greater access to the US market through alliance with a US carrier and the operational and financial benefits of accompanying anti-trust immunity that only the US government can provide. On the other hand, while wishing to hold onto their more lucrative, long-distance traffic, they cannot afford to surrender or share intra-European traffic, since it helps to sustain the long-haul services. Equally, they are not enthusiastic about encouraging more competition at hubs which already attract the largest numbers of transatlantic and connecting long-haul passengers passing through Europe.

The diplomatic problems of governments and the strategic problems of "their" airlines are intimately connected. All the major carriers in France, the UK and Germany have formed alliances with US carriers, but only one carrier (Deutsche Lufthansa) has obtained US anti-trust approval for the alliance concerned.<sup>15</sup> The reason for the disparity is that only the German government has so far concluded an open skies agreement with the US, and such an agreement is a condition for the US granting anti-trust immunity to alliances with non-US carriers. Airlines such as BA or Air France must protect - and if possible expand - their share of their

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<sup>13</sup> The Netherlands has two flourishing secondary international carriers - Martinair and Transavia - apart from KLM (though the latter has large equity holdings in both).

<sup>14</sup> Apart from the Netherlands, six EU Member-States (Austria, Belgium, Denmark, Finland, Luxembourg, and Sweden) now have open skies agreements with the US, as have Iceland, Norway, and Switzerland.

<sup>15</sup> BA's alliance with USAir ended on March 29th 1997 and its alliance with American has yet to receive official approval in either the US or the UK. Virgin Atlantic, BA's British rival on international services, has a "blocked space" agreement with Delta. Lufthansa has an alliance with United, while Air France has recently concluded a marketing agreement with Continental and Delta. It may be noted that, with the demise of the BA-USAir alliance, none of the current agreements among the major carriers (apart from KLM-Northwest) involves any equity holding. Delta's alliance with Swissair, Sabena and Austrian does involve a very small exchange of equity between the airlines concerned.

national markets (both the internal and external markets) and their share of intra-EU traffic: the very size of all these markets make them highly attractive to American carriers, to other European airlines and to domestic start-up carriers.<sup>16</sup>

The declared purpose of the US in concluding open skies agreements with other European states is precisely to wear down the British and the French, threatening their carriers with a diversion of trade, through passengers switching to other European airports where open skies has led to lower fares, more seats and greater competition. This strategy has worked quite well, at least in the case of the Dutch agreement.<sup>17</sup>

(b) Location-specific advantage:

Because of the nature of the industry, location is particularly important for airlines. An airline may benefit from having a centrally-located base ("central" in relation to its own regional market - say, Europe - or to adjoining regional markets - say, the Caribbean and central America for airlines based in the southern US). It may also suffer from being a "peripheral isolate."

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<sup>16</sup> For purposes of self-defence (and to enlarge their "feed"), they can, of course, decide to set up or acquire subsidiaries or allies in neighboring EU Member-States.

<sup>17</sup> The number of transatlantic passengers flying through Schiphol airport, Amsterdam, increased by 74% over a five-year period, reaching 2,400,000 in 1994: in 1995, Amsterdam overtook Paris Charles de Gaulle as the fourth largest European transatlantic gateway (Perry Flint, "If you can't beat 'em..." Air Transport World, May 1996, 41; Joan M. Feldman, "Some call it oligopoly," Air Transport World, May 1996, 46). The share of the US-Netherlands market in overall transatlantic service went up from 5.6% in 1978 to 7.7% in 1993 and continued to rise in 1994 and 1995 (Harold Shenton, "Codesharing only part of the big picture," Avmark Aviation Economist, May 1995, 2). This expansion also helped the US airports used by KLM-Northwest. In 1993 (the first year after the conclusion of the Dutch open skies agreement), Detroit and Minneapolis had increases in international traffic of 11% and 14% respectively, set against a national average of 4.9% (Harold Shenton, "Tracking the 1993 trends," Avmark Aviation Economist, August 1994, 14). Northwest-KLM began a new service between Amsterdam and Minneapolis in April 1994 with an initial 1,942 seats available each week. By mid-summer, capacity had been increased to 9,758 in response to demand and in August a second daily flight was added on the route ("Northwest, KLM add Amsterdam flights," Aviation Week and Space Technology, 29 August 1994, 30).

Given the history of domestic protectionism, an obvious strategy is to consolidate a domestic base, represented in control of a key airport and/or a domestic network. But "locational advantage" depends not just on the strength of a presence in a market, but also on the size of that market and its position relative to other markets. Because of their dependence on location and the regulatory obstacles to their establishment abroad, airlines actually resemble states in classical realist theory. Their managements have to accommodate their ambitions to the geopolitical realities of their situation. Unless this situation happens to be accompanied by a very substantial domestic market (no-one describes the US as "isolated"), even a well-managed airline can be trapped in a geopolitical corner.<sup>18</sup>

Location thus provides one variable relevant to identifying the parameters within which airline managements choose strategies. On this basis we can distinguish between:-

(1) those European countries that offer large and central markets (France, Germany, the UK);

(2) those that offer small but central markets (Belgium, Luxembourg, the Netherlands, and Switzerland;

(3) those that offer large but peripheral markets (Spain, Italy); and

(4) those that offer small and peripheral markets (Austria, Denmark, Finland, Greece, Ireland, Portugal, and Sweden).<sup>19</sup>

The significance of location differs according to whether we are examining intra-European markets or long-distance markets. Within the former, airlines will be free after April 1997 to establish themselves wherever they wish within the territory of the EU. Thus in principle, Finnair (for example) could decide to set up a network within France and Germany. It could, as far as the rules applied by Brussels are concerned, cut through the

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<sup>18</sup> Thus a KLM official recently explained his company's decision to form an alliance with Kenya Airways rather than with the rather larger South African Airways (SAA) by remarking:

We would never have done such a deal with SAA. Hub-to-hub flying with a catchment area at both ends, such as Amsterdam-Detroit with Northwest, is very profitable. Beyond South Africa is water.

(Joan M. Feldman, "Potential realized," Air Transport World, December 1996, 45).

<sup>19</sup> Four of which have open skies agreements with the US.

limitations imposed by being based in Helsinki and become a Finnish-owned airline operating entirely outside Finland.

But such a strategy would be risky. It would entail abandoning all the advantages accruing to a long-established domestic monopoly airline in its home country. It would also involve taking a chance on establishing a competitive niche on foreign territory, where the relevant home-country carriers could benefit from those same advantages. Further, it might be unpopular with Finnish politicians and voters who might argue that as a state-owned carrier, Finnair's first obligation is to provide services to and within Finland.

In relation to long-distance routes, the nationality constraints of the bilateral system would prevent even consideration of such a strategy. Bilateral agreements require governments to designate carriers of their own nationality to operate on specified routes: routes between Finland and the US are controlled by agreements between the Finnish and US governments. Since the same principle applies to routes between, say, France and the US, it would be extremely difficult for Finnair to get the required authority to operate between Paris and New York.

This asymmetry in regulation has an important strategic implication. The coexistence of a completely open market within Europe and a nationality-constrained market between Europe and third countries (such as Canada) means that those airlines with large markets and/or central locations may be able to use the freedom of the EU single market to draw traffic away from carriers based on the periphery. Although the US has "open skies" agreements with Finland and other EU states, Finnair is still restricted under this agreement to the rather thin US-Finland market, and it suffers all the associated disadvantages of low frequencies and high costs.

Finnish and US passengers, however, have the choice of flying through a variety of US and, most importantly, European cities. At first sight, this does not give an advantage to one carrier or carriers based in any one country over others. Finnair could in principle create a hub in Helsinki (as Icelandair has in Reykjavik) and, through lower fares or special service features, draw in passengers from other EU countries for long-range services. But the attractions would have to be substantial to get passengers from France or the UK to travel the extra distance to Helsinki, and the incentives would have to include low intra-EU fares and frequent flights between Helsinki and other EU cities. Otherwise, larger carriers in western Europe would reap the advantages of central location and larger domestic markets, creating economies of scale that would enable them to offer lower fares and more frequent services on transatlantic and other long-distance routes.

This case exemplifies a more general problem of economic integration within the EU. It happens that the geographical center



of the EU is also the area with the largest population: in the year 2000, France, Germany and the Benelux countries alone will account for 164 million of the EU's total population of 344 million; Italy, Spain and the UK will account for another 160 million; while the remaining six, geographically more peripheral states will together account for only 26 million.<sup>20</sup> To the extent that establishment in a large national market or populous EU region provides the basis for more competitive firms (firms that can harvest economies of scope and scale), integration may occur at a cost to the airlines (and other firms) based on the periphery of the single market. Their strategies are therefore likely to be defensive in character or certainly quite different from those of their more fortunately-located rivals. What their choices may be is discussed in the concluding section of the paper.

(c) Firm-specific advantage:

To counter locational disadvantages or to distinguish itself competitively, a firm may have or seek a special reputation or market niche. According to Michael Porter, such firm-specific advantage usually derives from cost leadership (being the lowest-cost producer) or product differentiation (establishing a particular reputation for quality or design). It may also derive from securing a niche in a particular region or in a product for which the market is limited.<sup>21</sup>

In the air transport industry, cost differentiation takes the form of concentrating on different kinds of traffic. The most basic distinction is between passengers and cargo. This is pertinent even in a consideration of passenger transportation since European carriers vary significantly in the degree to which they derive revenue from the two sources, and fleets (and even individual aircraft types) can be reconfigured to allow for different mixtures of cargo and passenger traffic.<sup>22</sup>

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<sup>20</sup> Figures from John Cole and Francis Cole, The Geography of the European Community (London: Routledge, 1993), 16-17.

<sup>21</sup> Michael Porter, Competition in Global Industries (Boston: Harvard Business School Press, 1986), cited in P.W.Daniels, Service Industries in the World Economy (Oxford: Blackwell, 1993), 43.

<sup>22</sup> Rarely-discussed though they are, the differences between EU carriers in respect of dedicated cargo equipment are significant. Forty-six per cent of both KLM's and Lufthansa's traffic in 1992 consisted in carrying cargo, compared to only 27.6% of BA's traffic. Twenty-three of KLM's 29 Boeing 747s are so-called "combis" - aircraft configured to carry both passengers and freight in divided main deck holds. In trading in Airbus 310s for Boeing 767s, KLM obtained an extra 15 tons' worth of cargo

Within the passenger market, the main distinction is between carriers appealing to different types of passenger. At one extreme are relatively high-fare carriers (such as SAS and Swissair) that have established a reputation as airlines used mainly by business travellers. At the other extreme are those (such as Southwest in the US and Easyjet in Europe) that make their appeal mainly on the basis of lower fares. This distinction does not necessarily or simply reflect company strategy: most airlines strive to attract business travellers, but some succeed more than others. Also, some business travellers (or their employers) will choose lower-cost carriers despite the inconveniences that may be associated with flying on such airlines.

Other bases for competitive advantage may include frequency (and directness) of service, quality of service (including - not least - seat size and pitch), on-time performance, and (informally) safety reputation. Two other FSAs - inward and onward flight connections - are partly derived from location: airports located centrally and/or in large markets are likely to have more connecting services. In a more localised sense, ease and speed of ground connections may also be a source of competitive advantage, especially where (as in much of Europe) surface transport is a major competitor with air transport.<sup>23</sup> Airlines do not (interestingly enough) compete against each on the basis of speed, though this is a vital factor in competition against other modes of transport within Europe.

In answering the crucial question - how will firm specific advantage be affected by and developed in an integrated, liberalized market - it is important to consider what factors (in addition to market stakes and locational advantage) will affect the choice and feasibility of strategies. One basic factor is a carrier's costs. In both the US and Europe, the actual revenue yield per seat has been declining steadily, partly due to increased competition and its effect on fares. Deregulation in the US did produce market segmentation: some airlines chose (or were forced) to pursue a mass market, which (with lower fares) entailed continual reduction of costs, especially labor costs. A few chose to cater solely to first-class or executive passengers, offering a

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capacity per flight, while it doubled cargo capacity in replacing DC10s with (the same manufacturer's) MD-11 (Douglas W. Nelms, "The new wave - Dutch style," Air Transport World, August 1996, 53, 56).

<sup>23</sup> The intense struggle over access to London Heathrow reflects a belief that the former offers decisive advantages over Gatwick in respect of both air and ground connections. Several European airports (and airlines) are trying to improve their competitive edge by improving air-rail links, which may even involve remote check-in facilities for luggage.

small number of flights and only on routes with heavy traffic. Most airlines tried to balance appeal to business travellers with filling the rest of the aircraft with passengers mostly travelling on a variety of discount fares.

The European situation differs from the deregulated US market in at least five respects. First, business and official travellers are a larger proportion of all passengers than in the US. This is partly because of the higher average cost of air travel, but it is also, secondly, because shorter inter-city distances (and better rail service) make surface travel a preferred alternative for passengers (such as many so-called "VFR travellers") with less money and more time.<sup>24</sup>

Thirdly, much mass recreational air travel in Europe (and between Europe and North America) is handled by non-scheduled charter carriers, many of which operate substantial fleets on routes quite different from those of the scheduled airlines. In the US, the major carriers and the non-scheduled carriers compete directly for all non-business traffic. Fourthly, though all airlines face major fixed costs, European airlines face higher fuel and landing charges than their American counterparts, while labor costs have historically been higher than in the US. Fifthly, new entrants face even greater runway and air traffic control congestion than in the US.

#### Strategic convergence and divergence:

Despite differences in markets, competition from other modes, and regulatory history, the responses of European carriers to liberalization and the advent of the single market have for some time shown similarities to those of US airlines to deregulation. But liberalization is also leading to strategies that suggest both a divergence from American experience and - more importantly - a differentiation among European carriers that has important implications for the eventual pattern of control and competition.

The broadest similarity to American experience is the almost universal attempt to increase productivity, to cut costs and to shed non-core businesses. Cost-cutting has meant both holding down salaries and stabilizing or reducing labor forces. Airlines are also seeking to achieve economies by standardizing fleets and (through alliances) sharing operational and marketing costs (referred to in economic writing on services as "economies of agglomeration" and "economies of common governance"). Thus the alliance between Sabena, Swissair and Austrian Airlines has led to standardization of fleets, joint ordering of new aircraft, and

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<sup>24</sup> "VFR" stands for "visiting friends and relatives" (also, confusingly, for "visual flight rules").

sharing of capacity on transatlantic services.<sup>25</sup>

Alliances are also achieving economies of scope, as in the cases of Lufthansa's arrangements for redistribution of routes with SAS and, more recently, Air France's arrangement to share routes with Alitalia and to establish "a wide-ranging business agreement designed to lower operating costs and increase competitiveness."<sup>26</sup> Finally, there is evidence of a trend toward vertical integration, in the form of acquiring or allying with regional carriers, which will become (indeed, already largely are) feeders to the majors at their hubs.<sup>27</sup> Such a trend would follow American experience, which saw a dramatic reduction in the number of independent regional carriers in the first decade of deregulation.

Such moves do evoke some of the more ironic outcomes of American deregulation. A marketing and operational alliance of two state-owned carriers evokes not only the ancien regime in European civil aviation (when international services were monopolised by state carriers operating a common schedule and even pooling revenue) but also the re-emergence of oligopoly in the US in the mid-eighties. As in the US, the success of liberalization in Europe rides on the theory of "contestable markets," which assumes that entry costs in the industry are sufficiently low to prompt and sustain competition once monopolies or oligopolies emerge and begin to extract rents from their control of markets. A key factor here will be the ability of challengers (whether start-up airlines or the surviving, competing major carriers) to gain adequate access to airport slots.

An equally striking difference from American experience (so far) is the lack of equity buy-outs, at least among major carriers. The only serious raid so far has been by a non-EU carrier (Swissair), taking a 49.5% interest in Sabena. State ownership is clearly the major barrier to a consolidation like that which occurred in the US in the nineteen-eighties, but the continuing privatization of European airlines will increase opportunities for equity purchase. Indeed, substantial cross-border acquisition by major carriers has already occurred, but in the form of buying equity in rivals of national airlines in neighboring countries.

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<sup>25</sup> Pierre Sparaco, "Swissair pursues 'entrepreneurial freedom'", Aviation Week and Space Technology, 6 January 1997, 33; "Newsbreaks", Aviation Week and Space Technology, 23/30 December 1996, 9.

<sup>26</sup> Pierre Sparaco, "Alitalia, Air France pursue new business links," Aviation Week and Space Technology, 10 February 1997, 32.

<sup>27</sup> Remarks by Mike Ambrose, president of the European Regions [sic] Airlines Association, at panel organized by the Transportation Research Board, Washington, D.C., 15 January 1997.

BA, the most aggressive cross-border investor, has subsidiaries in France and Germany, while SAS and KLM both have substantial interests in British independent carriers.<sup>28</sup>

The advent of the single market offers the potential for much greater cross-border operation, including the establishment of hubs by European airlines in Member-States other than their own and the operation of services within the territories of other Member-States. Such cabotage flights have already begun, subject to certain restrictions.<sup>29</sup> The other side of such opportunity is necessarily the threat of invasion by "foreign" carriers, as well as that of start-up carriers (essentially the same challenge as that confronting American airlines in the late seventies, but in a different territorial context).

Writers on service industries often argue that deregulation is the spur to much internationalization of business.<sup>30</sup> It destabilizes the strategic setting of domestic business and opens the door to takeovers and other kinds of direct investment by

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<sup>28</sup> BA controls TAT (and since November 1996) Air Liberte in France and Deutsche BA in Germany. SAS has a 25% interest in the Airlines of Britain Group, which until very recently included British Midland, a major rival to BA on both domestic and European routes. (British Midland, which controls more slots at Heathrow than any carrier other than BA, is currently negotiating over an alliance with Lufthansa - a serious challenge to BA's dominance of the UK by the German carrier). KLM has a 15% holding in Air UK and uses this connection to feed traffic from British airports into its Amsterdam international hub.

<sup>29</sup> Until April 1997, "Community carriers" are allowed to carry domestic traffic up to 50% of an aircraft's capacity on flights that involve an international leg. For example, Lufthansa might operate a service from Frankfurt to Paris, continuing to Marseille. On the last leg of the journey, it would be permitted to fill up to half of the seats with passengers boarding in Paris.

<sup>30</sup> Thus Daniels writes:

In order to sustain growth and profit expectations, it is now necessary to gain access to new markets. Services that have thrived on traditional home markets can no longer afford to do so, either because those markets are saturated and there is no scope for further product innovation or because of the effects of deregulation on the competitiveness of service firms in other geographical markets.

(Daniels, Service Industries in the World Economy, 43)

foreign firms. A natural, prudent and even necessary response for all established firms is to strike first - to move aggressively into foreign markets, partly to capture new business, partly to deter rivals, and partly to insure against loss of domestic market share.

But managements may in fact respond in different ways. While it is beyond question that deregulation (and, in this case, economic integration) creates a dynamic environment and offers compelling arguments for an international strategy, the circumstances and stakes of firms (in this case, airlines) are in fact quite different. It is one thing to "create a level playing field"; quite another to ensure (much less to insist) that the players are all the same age, the same size, and have the same experience. Since they are patently not the same, their responses are likely to differ. And since they enter the game with distinct advantages and disadvantages, the game is as likely to accentuate those differences as to reduce them.

To illustrate the variety of situations and possible responses to them, I set out, relative to Table 2, a rough typology of airlines, combining the factors discussed above. I then outline a range of current and potential strategies in response to liberalization and the EU single market.

Looking only at the main national carriers, it is clear that their revenues, their market stakes, the sizes of their markets, and their locations differ substantially. They can be grouped in several ways, but if we follow the classification used above, we might divide them as follows:

- 1) Large market/central location<sup>31</sup>: Lufthansa, BA, Air France;
- 2) Small market/central location: KLM, Sabena, Swissair, Luxair;
- 3) Large market/peripheral location: Alitalia, Iberia
- 4) Small market/peripheral location: Austrian, SAS, TAP, Aer Lingus, Olympic, Finnair.

To make sense of strategic differences within each category, it is helpful to subdivide further, and again quite arbitrarily, according to market stakes and total revenue. These factors distinguish carriers who are more preoccupied with long-haul services from those more concerned with domestic or intra-European

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<sup>31</sup> Locations within 400 miles of Brussels are here classified as "central", those more than 400 miles from Brussels as "peripheral."

TABLE 2:

## FACTORS IN AIRLINE STRATEGY

<u>CARRIER:</u> (Country) [Revenue, 1995,\$mn]	<u>MARKET STAKES</u> (% of total traffic [1991])			<u>DOMESTIC POPULATION:</u> (x mn)	<u>LOCATION:</u> (distance from Brussels, miles)	<u>RPKs</u> <sup>32</sup> <u>flown</u> (1995) (x mn)
	<u>Domestic</u>	<u>EU</u>	<u>Non-EU</u>			
LUFTHANSA (Germany) [ 9,774]	36.0	43.5	20.5	81.2	200 (Frankfurt)	59,916
BA (U.K.) [10,124]	21.8	49.3	28.9	59.1	200 (London)	100,489
ALITALIA (Italy) [ 4,645]	39.3	43.4	20.3	58.6	740 (Rome)	31,748
AIR FRANCE (France) [ 7,956]	20.9	49.4	29.7	57.9	160 (Paris)	49,605
IBERIA (Spain) [ 3,385]	52.0	37.3	10.7	40.7	825 (Madrid)	23,813
K.L.M. (Netherl -ands) [ 5,094]	0.7	44.5	48.5	15.3	110 (Amsterdam)	44,574
S.A.S. (Scand -inavia) [ 3,863]	44.3	48.7	6.1	13.7 <sup>33</sup>	475 (Copenhagen)	18,773
T.A.P. (Portugal) [ 1,099]	25.7	53.4	20.9	10.7	1,060 (Lisbon)	7,716
OLYMPIC (Greece) [ 943]	64.1	24.6	11.3	10.2	1,280 (Athens)	8,082

<sup>32</sup> Revenue Passenger Kilometers - a measure of the number of passengers carried multiplied by total distances travelled.

<sup>33</sup> Denmark and Sweden only.

<u>CARRIER:</u> (Country) [Revenue, 1995,\$mn]	<u>MARKET STAKES</u> (% of total traffic [1991])			<u>DOMESTIC POPULATION:</u> (x mn)	<u>LOCATION:</u> (distance from Brussels, miles)	<u>RPKs flown (1995)</u> (x mn)
	<u>Domestic</u>	<u>EU</u>	<u>Non-EU</u>			
SABENA (Belgium) [ 2,041]	0.0	67.4	32.6	9.9	0 (Brussels)	8,620
AUSTRIAN (Austria) [ 1,063]	N.A.	N.A.	N.A.	7.7	575 (Vienna)	4,915
[SWISSAIR] (Switzerland) [ 3,452]	N.A.	N.A.	N.A.	6.8	300 (Zurich)	20,302
FINNAIR (Finland) [ 892]	N.A.	N.A.	N.A.	5.0	975 (Helsinki)	10,434
AER LINGUS (Ireland) [ 1,110]	10.1	68.2	21.7	3.5	475 (Dublin)	5,259
LUXAIR	N.A.	N.A.	N.A.	0.4	110	380

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Sources: Commission of the European Communities, Air Transport Relations with Third Countries. Communication from the Commission to the Council, COM(92) 434 final, Brussels, 21 October 1992, 12, and Table E, 51; "Aerospace Source Book," Aviation Week and Space Technology, 13 January 1997, 271-306; "World Airline Report," Air Transport World, June 1996, 43, 46.  
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services, and those with larger stakes from the minor players. A more refined classification emerges, thus:

1) Large market/central location:

- (a) Largest - smallest long-haul stake: BA, Air France, Lufthansa;
- (b) Largest - smallest total revenue: BA, Lufthansa, Air France;

2) Small market/central location:

- (a) Largest - smallest long-haul stake: KLM, Swissair, Sabena, Luxair<sup>34</sup>;
- (b) Largest - smallest total revenue: KLM, Swissair, Sabena, Luxair;

3) Large market/peripheral location:

- (a) Largest - smallest long-haul stake: Alitalia, Iberia;
- (b) Largest - smallest total revenue: Alitalia, Iberia;

4) Small market/peripheral location:

- (a) Largest - smallest long-haul stake: Aer Lingus, TAP, Olympic, Austrian, SAS, Finnair<sup>35</sup>;
- (b) Largest - smallest total revenue: SAS, Aer Lingus, TAP, Austrian, Olympic, Finnair.

We can now characterize more fully each group and, bringing in the factor of firm-specific advantage, examine briefly common and individual strategic dilemmas and responses.

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<sup>34</sup> Swissair ranking derived from graph on Available Tonne Kilometers in Lehmann Brothers, European Airlines: A Turbulent Decade, 14 September 1993, 6.

<sup>35</sup> Austrian and Finnair rankings derived from graph on Available Tonne Kilometers in Lehmann Brothers, European Airlines: A Turbulent Decade, 14 September 1993, 6.

Group 1 (large market/central location) (BA, Air France and Lufthansa):

This group comprises the national carriers which have the largest domestic traffic bases and the largest total revenues, and which dominate hubs that are centrally-located and offer extensive long-range and intra-EU connections. All three have major stakes spread across the domestic, intra-EU and long-haul markets, with BA having the larger long-haul stake.

Strategically, these airlines are attractive prospects for alliances with major non-EU carriers, and all three in fact have marketing alliances with leading American airlines. They also need such alliances in order to maintain their competitiveness in the transatlantic market, which is an important source of profit for all three carriers.

Despite the sizeable resources of these airlines, they also face serious strategic dilemmas. The size of their domestic markets makes them attractive targets for other carriers. BA has been facing substantial competition for some years within the British market and has responded by absorbing some of its rivals and converting others into franchisees. It is also moving aggressively into the German and French markets. Lufthansa is vulnerable because of its high costs and high domestic fares.

Air France, also involved in cost-cutting, is pursuing an essentially defensive strategy quite different from BA's expansionism. It has depended on the French government to get EU approval for a very large injection of state capital (which, according to its rivals, has been exploited to enable Air France to offer bargain-basement fares on its European and long-haul services).<sup>36</sup> It has made few moves to set up subsidiaries outside

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<sup>36</sup> The French government's generosity to Air France has not necessarily been reciprocated. In a remarkable speech to the Saint-Simon Foundation earlier this year, Christian Blanc, chairman of Air France, attacked "interference" by the French government in the management of French business, particularly in the public sector. Blanc complained:

It is constantly judge and party to the case. It interferes in everything, seeking compromises everywhere to minimize risks but having absolutely no overall strategy.

("Europe Report," Air Transport World, February 1997, 14).

These remarks may have been stimulated by earlier reports that the transport minister was pressing Air France to buy new long-range planes from Airbus A340s rather than from Boeing (David

France and has, indeed, retreated from two earlier outside investments.<sup>37</sup> Instead, it has (as noted above) begun to develop a marketing relationship with another financially-challenged state carrier, Alitalia. It has, very belatedly, established a code-sharing relationship with two American carriers and is apparently banking on this relationship to improve its finances. But France has consistently rejected the concept of an open skies agreement with the US and will probably continue to do so until Air France's finances and competitive position have improved.

As this comparison suggests, the fourth variable identified above - the availability or otherwise of state aid - is relevant to understanding strategic differences between these three carriers. BA, as a privatized carrier, can call on some diplomatic assistance in protecting its long-haul market, but within the EU market it functions without state support (and is a persistent critic of subsidies). Lufthansa is a carrier in course of a privatization that was prepared for this process and for the rigors of the deregulated, single market by government pressure and assistance in cementing its relationship with a US carrier. Air France is a state-owned carrier whose strategy has depended on government assistance in protecting its domestic (and long-haul) markets and in restructuring itself to survive the single market.<sup>38</sup>

Each of the carriers in this group enjoys some firm-specific advantages. Lufthansa, though apparently not well-regarded for its service within Germany, has striven to establish an international reputation for reliability and safety. BA has concentrated on establishing a superior reputation for customer service, with distinctive "brands" of cabin service (which, indeed, it franchises to partners in the UK and abroad). Both BA and Air France have the advantage of long associations with African and Asian countries which were formerly British and French colonies.<sup>39</sup>

Despite their marked differences, all three carriers in this group are likely to become dominant on their own or as partners

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Owen, "State clips Air France's wings," Financial Times, 9-10 November 1996).

<sup>37</sup> Early in the nineties, Air France invested in the Czech airline CSA (in an attempt to create a hub for eastern European traffic) and in Sabena, but has abandoned both investments. It retains shares in six North and sub-Saharan African and Middle Eastern airlines.

<sup>38</sup> All three carriers also face competition from national railway systems - two state-owned, the third privatized.

<sup>39</sup> A form of association intriguingly - and perhaps rightly - described in some market surveys as "cultural affinity."

within the EU market, and all have the potential to be major partners in global enterprise alliances. Achievement of this potential means retaining market share at their domestic hubs, strengthening their European networks so as to provide traffic feed (and onward connections) for long-haul routes, and enlarging their access to major overseas markets (notably in the US and Asia).

The dilemma for them is that, as suggested above, the protection of local markets is likely to upset non-EU governments and airlines. Also, alliances involving these carriers are certain to provoke questions about the danger of oligopoly from other airlines and from many governments. This dilemma makes for some fine calculations of the costs and benefits of market opening (and of related corporate alliances), as the current debates over the American-BA alliance demonstrate.

Group 2 (small market/central location) (KLM, Swissair, Sabena, and Luxair):

This group comprises carriers that, while restricted by a small domestic market, have good central locations. This combination of constraint and opportunity may lead to radically different strategies, all (necessarily) involving external services.

One strategy is to remain a highly-localized regional carrier, as has Luxair. Despite the centrality of the Grand Duchy (and its prominence in the EU), its local market is too small to attract outside carriers (except for occasional low-cost transatlantic carriers) and the national carrier can therefore depend on a degree of control approaching monopoly, albeit in a very small market.

Another strategy - that pursued for many years by KLM (and in principle available to Luxair) - is to exploit location so as to draw in traffic from neighboring states to feed a long-haul network. KLM has no domestic network of any significance and has a domestic market of only 15 million. Yet it has a revenue higher than those of Alitalia and Iberia, both based in countries with populations of over 40 million. Moreover, with a smaller fleet than either, it flew in 1995 thirteen million more Revenue Passenger Kilometers than Alitalia and nearly double those flown by Iberia. It also derives a higher percentage of its revenue from long-haul flights than any other EU national carrier (indeed, at 48%, its long-haul stake is proportionately equal to those of BA and Lufthansa combined).

This strategy has led KLM into a particularly close (if stormy) relationship with a US carrier and has led the Netherlands government to be a strong advocate of free trade in international aviation. Commercially, the strategy has been highly successful, but it does entail particular vulnerabilities and risks. It requires a strong intra-EU network to sustain traffic for its long-

haul services: KLM has recently acknowledged that it is weak in this respect and it will certainly find itself facing more competition on EU routes.

Moreover, the strategy entails great dependence on non-EU partners, such as Northwest. This relationship may conflict with a strategy of allying with other small state carriers within the EU for purposes of strengthening the European network and for mutual defense against the BAs and Lufthansas. Such a conflict destroyed the proposed "Alcazar" alliance between KLM, SAS, Swissair, and Austrian in 1993, when KLM insisted that Northwest be the US partner for the new alliance in the face of its partners preference for Delta. KLM has failed to find a European partner and it recognizes the need to do so. But the same problem could arise again, especially since nearly all the other EU carriers are now allied with carriers other than Northwest.<sup>40</sup> Moreover, KLM's strategy of (indeed, its dependence on) attracting passengers from neighboring states may have diminished its appeal as an alliance partner.

A third strategy logically open to smaller countries with central locations is that of alliance with each other, complemented by a shared relationship with one or more major non-EU carrier. This has, in fact, been the route taken by Sabena, in company with Austrian and Swissair (itself technically a non-EU carrier), all of the group having Delta as a US partner. Swissair has in effect bought into the EU market by purchasing a 49.5% interest in Sabena and is emerging as the controlling partner. The alliance offers a range of purchasing and operational economies to the members (including fleet standardization). Furthermore, with three well-separated hubs, it creates a broad and complementary network across Europe, giving access to markets in north-western Europe (through Brussels), eastern Europe (through Vienna), and central Europe and Italy (through Zurich).<sup>41</sup> The alliance also represents a significant bloc for purposes of negotiating with non-EU partners (and suppliers) and provides Delta and other overseas partners with entry to three distinct European markets.

Group 3 (large market/peripheral location) (Alitalia and Iberia):

This group consists of two state-owned airlines, both of which

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<sup>40</sup> This may explain recent reports that KLM is engaged in talks with Iberia, which has no close ties to a transatlantic partner.

<sup>41</sup> Swissair and Delta are reportedly gaining a substantial number of transatlantic passengers from northern Italy, because of customers' dissatisfaction with Alitalia's long-haul services and fares.

have dominated significant domestic markets that are attractive to start-up domestic carriers and to other national carriers.<sup>42</sup> Both have experienced considerable financial problems and have received large amounts of state aid to restructure in anticipation of the advent of the single market. Both have relatively small stakes in long-haul routes and somewhat peripheral positions within the single market. While having large domestic populations and considerable assets for foreign tourism, neither has yet sought or concluded an open skies agreement with the US and their relations with US carriers have been intermittent and fairly recent.

Alitalia and Iberia have a doubly disadvantageous position, in that their hubs are away from the center of the European market while not being close to a connecting market. Earlier in the nineties, Alitalia bought equity in the Hungarian airline Malev, hoping (like Air France) to develop a market in eastern Europe. But Alitalia's management has, until recently, been skeptical of alliances with other carriers. In any case, it is not clear how, or why, an Italian-eastern European combination would work. Italy might seem a natural point for connections to north Africa and the Middle East, but other and larger airlines already have connections to these areas, and Alitalia is not in a financial position to provide real competition through low fares.

Moreover, Alitalia suffers another, more local geopolitical problem. Rome is remote from the main industrial areas of Italy, but the northern airports are for various reasons inadequate as alternative hubs.

Meanwhile, Alitalia is facing erosion of its domestic markets not only by new low-cost carriers such as Air One and Meridiana but also by other EU carriers (such as BA and Lufthansa) who have already begun to operate cabotage services within Italy.

In the long-haul market, Alitalia (or another Italian carrier) should be able to develop an FSA on the basis of Italy's tourist market and the considerable Italian emigrant communities in North and South America, but it has failed to do so. In fact, while Alitalia has a marketing agreement with Continental, Italy still has a very restrictive bilateral agreement with the US, the result of which is high fares and limited capacity.

Iberia's response to its locational problem has been to exploit its nationality and Spain's connections with Central and

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<sup>42</sup> At least in the case of the Italian market, the appeal may lie in the fact that Italy, despite its population, has a rather underdeveloped air transport market. The arrival of new carriers will test whether there is a large unrealized potential: the dramatic expansion of traffic on several routes suggests that there is.

South America to build a set of alliances in those regions, rather than to compete on North Atlantic routes. It bought equity in Chilean, Venezuelan and Argentinian airlines and established a hub in Miami, basing shorter-range aircraft there to provide connections to cities on the networks served by its affiliates. While this strategy was applauded in some quarters as "very exciting" and "[making] cultural sense", its implementation has suffered from the financial problems of the Argentinian and Venezuelan carriers, the second of which has recently entered bankruptcy.<sup>43</sup>

The combination of large markets and peripheral location makes both Alitalia and Iberia vulnerable to attack once the single market is complete, without enjoying obvious compensating advantages as long-haul carriers. As state-owned airlines, neither is immediately liable to being bought up (though Iberia is due to be privatized), but both face serious domestic competition. While their strategic choices are limited, alliances with other EU carriers seem likely in both cases and Spain (at least) is now in discussions with the US about an open skies agreement.

Group 4 (small market/peripheral location) (Austrian, SAS, TAP, Aer Lingus, Olympic and Finnair):

This group consists of smaller carriers, with small domestic markets and hubs that are peripheral within the European market. None has (or at least has so far identified) an adjoining market that would enable it to compensate for its peripheral position within the EU. All derive their main revenues from domestic and intra-EU traffic: at least two (SAS and Finnair) have actually cut back their long-haul services, while a third (Aer Lingus) has completely reorganized its long-haul operations.

As noted in the discussion of Finnair above, the future of such "peripheral isolates" is especially problematic, given the dynamics of the single market and the advantages it lends to those with central location, large domestic markets, and relatively deep pockets. The threat to these carriers is not one of a buyout by a foreign carrier: all are state-owned or have at least fifty per cent state ownership of equity. The danger is rather that they will be unable to grow or that they will become junior partners to larger carriers. More immediately, they may suffer erosion of their domestic and external traffic as a result of the

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<sup>43</sup> The Iberia initiative was described as "potentially .. very exciting" and "a plan that makes cultural sense" in the widely-circulated Lehmann Brothers assessment, European Airlines: A Turbulent Decade. As The Financial Times recently reported, a number of major Spanish service businesses have taken similar initiatives in Latin America: see David White, "Return of the conqueror," Financial Times, 5 March 1997, 13.

establishment of new domestic carriers or intervention by other EU carriers. Such erosion has already begun in the cases of Austria, Denmark, Ireland, Portugal, and (to a lesser extent) Sweden."

Leaving aside the question of what outcome would best serve consumers in these countries, we can identify several current and possible strategies for carriers in this group. One is alliance with other carriers in smaller countries - the step already taken by Austrian. But Austrian has the advantage of a fairly central location, and one close to eastern and south-eastern European markets. Apart from economies from joint marketing and acquisition, it is not clear what the rationale of a network composed of such a dispersed set of peripheral carriers would be or how it would help to attract passengers.

Another strategy (as in the cases of Alitalia and Iberia) is to identify an adjacent non-EU market or to build on special cultural or economic connections with more remote areas. Finnair has exploited its locational advantage relative to Russia and the CIS. TAP has such a "cultural" FSA in relation to Brazil and the ex-Portuguese colonies in southern Africa and is now trying to develop stronger connections with carriers in these regions.

A third strategy (and that which seems to be gaining favor) is to ally with a larger, more centrally-located carrier. The most important example of this strategy is the alliance between, on the one hand, SAS (and now Finnair) and, on the other, Lufthansa. SAS has sold off its larger jumbo jets and surrendered much of its long-haul traffic to Lufthansa, whose Frankfurt hub has now become the center for the alliance's North Atlantic services. While Copenhagen has become a hub for flights to North-East Asia, SAS's role is now mainly that of a collector and distributor of traffic in the Nordic countries and the Baltic. Moreover, the issue of competing loyalties to US carriers has been resolved by SAS giving

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" According to the European Commission, the main Austrian independent (Lauda Air) now offers capacity equal to 28% of that offered by Austrian (compared to only 5% in 1993); Maersk offers capacity equal to 31% of SAS's on routes to and within Denmark and Transwede some 16% of SAS's capacity on routes within Sweden; and Portugalia offers capacity equal to 29% of TAP's. The oldest and most successful challenge within this group is probably that of Ryanair in Ireland. Starting in the late eighties, Ryanair now has a capacity 60% that of Aer Lingus's. It offers low-fare services on a number of routes between Ireland and other Member-States and competes directly on the busy Dublin-London route (on which Aer Lingus depends for 40% of its revenue) (Commission of the European Communities, Impact of the Third Package of Air Transport Liberalization Measures, Communication from the Commission to the Council and the European Parliament, COM(96)514 final, 22 Oct 1996, 18).



up its alliance with Continental and joining the Lufthansa-United combination. Within Europe, SAS also had to give up its membership of Swissair/Austrian alliance.

Not surprisingly, both the creation and the terms of this alliance have caused some controversy. Apart from its possible implications for competition, the character of the alliance has been a politically sensitive issue in that it does involve demoting the Scandinavian carrier to the status of "junior partner" to the German airline.<sup>45</sup> Recognizing the political delicacy of an apparent German takeover, the negotiators of the alliance did agree that no equity would change hands. But in operational terms SAS accepted a complete integration of its activities with those of Lufthansa: it remains an independent carrier but one without external allies other than those of its German partner.

Does such a future await the other peripheral EU carriers? Apart from some code-sharing agreements, Aer Lingus, Olympic and TAP have not yet taken steps publicly towards alliances with either EU or North American airlines.

They could pursue a fourth option - the more passive and defensive one of retrenchment and consolidation. This strategy may be feasible as far as their domestic markets are concerned. As noted above, independent carriers have begun to challenge the national flag carriers on domestic routes in Austria, Denmark, Portugal, and Sweden (but not so far in Finland and Greece). However, it seems unlikely that other EU carriers will make the same effort to penetrate these markets that they are evidently intending to make in Italy, Spain and France and on intra-EU routes. The populations concerned are fairly small, and distances between cities are in several cases too short to make air transport an effective challenger to rail or road transport.

The more serious problem will be on international routes within the EU. By definition, countries with smaller markets cannot sustain large networks and therefore external routes are necessary to support most carriers. Less obviously, higher fares can be (and are) charged on international routes than on domestic routes of comparable length, partly because airlines do not have to meet the same competition from railways that they encounter on domestic services.<sup>46</sup> It will be on these routes that small country

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<sup>45</sup> The term "junior partner" is used in several articles on the alliance: see, for example, Hilary Barnes, "Lufthansa, SAS to merge routes," Financial Times, 12 May 1995.

<sup>46</sup> For striking evidence of the higher fares for international services, see Commission of the European Communities, Impact of the Third Package of Air Transport Liberalization Measures, 6. In early 1996, for example, the fare

carriers will meet increasing competition (such as SAS has recently met from the discount carrier Virgin Express). A simple defensive strategy will not be adequate in such circumstances.

Airlines in this category may, then, have to choose between some equally uncomfortable options. The most comfortable is alliance with other carriers similarly placed. But this raises the question of what it is that they are sharing and how such an alliance will improve their individual and collective competitive positions. They may, secondly, choose to live independently and reduce their exposure (and ambitions). But such a strategy will probably require reorganization and stringent cost-cutting in order to meet competition from domestic and low-cost EU competitors, unless a particular niche can be created and defended.<sup>47</sup> Or, thirdly, they may decide to ally with a stronger EU partner, sacrificing at least some independence for the protection, the savings and the greater resources to be gained by being a member - albeit a junior member - of a global alliance.

#### Conclusion:

The liberalization of air transport within the EU, the pursuit of economic integration in this sector, and the continuing pressure to privatize state carriers have created a situation that is stressful for airline managers and government officials, intriguing for passengers and corporate clients, and fascinating for observers of the industry. It offers another test of the EU's public philosophy about the general benefits of a single, liberalized market, as well as a testing of the instruments it applies to ensure a "level playing field." Finally, it provides an opportunity for comparison with similar processes outside the EU, notably experiences of deregulation in the US and elsewhere.

The argument of this paper is, however, that there is no close analogy elsewhere. Such an analogy would apply if, say, airline deregulation in the US had been combined with the creation of an expanded version of the North American Free Trade Area, to include

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for a flight from Venice to Strasbourg in France was 190 ECUs, compared to 95 ECUs for a domestic flight at similar level of service from Venice to Rome - both journeys being about 290 miles. Between Madrid and Oporto in Portugal, the fare was roughly 215 ECUs, compared with a fare of 107 ECUs for a domestic flight, over the same distance, from Madrid to Malaga.

<sup>47</sup> In SAS's case, a decision was taken to concentrate (more exactly, to continue to concentrate) on business travellers. This decision in turn led to selling off the larger wide-body aircraft, since they could not be filled with business passengers and would therefore be unprofitable (Perry Flint, "There's no place like home," Air Transport World, November 1995, 49).

many of the states of Central and South America (to a total of fifteen), with a common market in aviation established across the entire area from northern Canada to the borders of Brazil. It would be an even closer analogy if all the major carriers in the countries concerned (including at least one in the US) were currently or recently state-owned and were at various stages of privatization. Only such a fantasy can convey the complexity and the novelty of the process now underway within the European airline industry.

For academic observers, the creation of the single air transport market (and parallel processes in other sectors, such as telecommunications and financial services) offers an unusual (and so far largely unrecognized) opportunity to juxtapose concepts and arguments relating to deregulation with concepts and claims relating to economic integration. Moreover, it requires us to examine the interaction of these essentially "domestic" processes with those of international trade and to ask, among other questions, how such interaction affects claims for free trade or protection. Should, for example, the fact that firms are being forced to undergo a transition that opens their markets both to domestic competitors and to competitors from neighboring states constitute a special ground for denying the claims to market access made by third parties such as the US?

Asking such questions forces us also to recognize that the stakes of businesses, the main actors in the drama of liberal integrationism, stretch across national borders and other jurisdictions. This, in turn, means that we cannot understand the processes at work within the EU, or evaluate the philosophy guiding it, without examining closely the strategies that businesses adopt in attempting to survive and prosper within the single market. This, in turn again, means examining not only the idiosyncrasies of particular sectors, but the circumstances of particular firms and of sectors in particular countries.

Pace the European Commission, the levelness of playing fields is not usually much of a preoccupation in most sports. The real issue is what experience and skills the team has and how good its coach and manager are. It may be enough for the referee to study and memorize the rule book, and even occasionally to read sections of it to captive spectators. But those who want to understand the game had better talk to some players and managers, and this seems to be an activity to which some EU officials are remarkably indifferent. In which case, they may be surprised and even embarrassed by some of the results - and they are certainly missing most of the fun.

# APPENDIX I

## FLAG CARRIER DOMINANCE ON DOMESTIC AND INTRA-COMMUNITY ROUTES, 1993

### MEMBER-STATE/CARRIER

Flights by flag carrier as % of all  
flights by carriers registered in  
Member-State

<u>MEMBER-STATE/CARRIER:</u>	<u>DOMESTIC ROUTES</u>	<u>INTRA-COMMUNITY ROUTES</u>
<u>ITALY</u> (Alitalia/ATI):	78.5	87.3
<u>SPAIN</u> (Iberia):	[64.0] <sup>48</sup>	[93.8] <sup>49</sup>
<u>GERMANY</u> (Lufthansa):	60.4	79.7
<u>FRANCE</u> (Air Inter):	51.3	78.4
<u>PORTUGAL</u> (TAP):	47.9	83.5
<u>DENMARK</u> (SAS):	33.7	78.2
<u>U.K.</u> (BA):	26.7	58.9

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--Source: Civil Aviation Authority (U.K.), Airline Competition in  
the Single European Market (London: C.A.A., 1993), CAP 623, 79-93.

<sup>48</sup> Percentage of passengers flown.

<sup>49</sup> Percentage of passengers flown.